



Mafex corporate magazine
Spanish Railway Association

Issue 16. September 2018



A consolidated rail network



The Spanish Pavilion: one of the standout elements in this edition.



TRIBUNE
Mr. José Luis Ábalos Meco, Minister of
Public Works of Spain.



Mafex Annual Meeting: The association informs of the most recent advances and activities.

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Innotrans 2018: Major presence of the Spanish railway sector in Berlin

Dear Friends,

This September Berlin hosts Innotrans 2018, the most renowned fair in the sector worldwide. From Mafex magazine, we wanted to give very prominent coverage to the elevated participation of Spanish companies in this important professional platform. For this reason, alongside the usual sections, a complete special edition has been included on its industry, its contributions and experience in the field of infrastructure, high speed and urban transport, amongst other aspects. In addition, the most significant international achievements and projects are detailed, as well as the constant technological developments with which these companies aim to contribute to a modern, safe, efficient and comfortable railroad network.

Likewise, in this dossier, readers will be able to find a detailed description of the companies that will be present at Innotrans 2018 and the stand, where they will be able to visit them to view first-hand their multiple solutions and products. Special mention deserves the signature invited of this ample monograph, to charge of the minister of Public Works of Spain, José Luis Ábalos Meco, that analyses the evolution of the Spanish rail sector and its increasing weight in the international market. Under the title "Proven experience on major infrastructure projects worldwide", a description about a potent industry that plays a key role inside and outside our borders is given.

Along with this extra edition, as in previous occasions, in the section "Mafex reports" the

main conclusions of the General Assembly of the association are compiled, in which the the renewal of the Management Committee was approved for the next four years.

Another of the main points was the presentation of the 18 new members registered since the beginning of 2018 and to whom from here we extend our warmest welcome, adding a total of 85 members in the Association.

In "Members News", the recent news from 21 of Mafex's companies is included: tender awards, appointments, new developments and progress in foreign markets. Furthermore, "Destination" includes a report on the railway in Germany, a country that boasts a closely consolidated network and which the federal government will continue to foster through new investments over the coming years.

The section "In depth" is dedicated this time to urban rail transport in Berlin; a city that enjoys an extensive and modern combined system comprised of metropolitan railway, tram, suburban and regional rail networks.

Finally, in "Innovation", 15 new technological advances are published that show the successful results of the R & D boost of Mafex companies.

We hope that all these contents are of your interest and look forward to greeting you at the Spanish Pavilion at Innotrans 2018.

¡Visit us at Innotrans 2018.

Hall 22, Stand 704!

MANAGEMENT: MAFEX.

MAFEX COMMUNICATION COMMITTEE: Albatros, Alstom Transporte, ArcelorMittal, Bombardier Transportation Spain, CAF Signalling, Idom, Indra Sistemas, Ingeteam, La Farga Yourcoopersolutions, Patentes Talgo, Siemens Spain, Thales Spain, TPF Getinsa Euroestudios and Stadler Rail Valencia **ADMINISTRATION:** comunicacion@mafex.es. **ADVERTISING:** comunicacion@mafex.es.

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Mafex General Assembly:

The association informs about the latest developments and news items



Mafex, held the Annual General Assembly in Madrid in a call that was widely attended by the representatives of the 85 associated companies. One of the highlighted item included in the agenda was the presentation of the 18 new members that have been accepted as partners since the beginning of 2018. This significant increase represents a path that consolidates the trajectory of Mafex and strengthens its service work both in the assistance in the internationalisation processes and in the defence of the sector's general interests. Within the framework of this meeting, the endeavours of the Communications Committee, under the auspice of Thales España, as the works of the the International and Competitiveness Committee, headed by Patentes Talgo, and the

AT THE GENERAL ASSEMBLY, WHICH TOOK PLACE IN MADRID LAST JUNE 27, WITH SIGNIFICANT PARTNER INPUT, THE PROMISING EVOLUTION OF THE DRE ACTIVITIES PLAN AND THE GROWTH OF THE ASSOCIATION WERE ALL STUDIED IN DEPTH.


Renewal of the members of the Management Committee

During the General Assembly another of the standout points was the renewal of the Management Committee, which is composed of representatives of the following 16 companies:

MANAGEMENT COMMITTEE	
ALBATROS	LA FARGA
AMURRIO FERROCARRIL Y EQUIPOS	METALOCAUCHO
ARCELORMITTAL ESPAÑA	PATENTES TALGO
BOMBARDIER	SENER INGENIERÍA Y SISTEMAS
CAF	SICE
IDOM	TECNIVIAL
INDRA SISTEMAS	THALES ESPAÑA
INGETEA POWER TECHNOLOGY	TYPSA

Management Committee. After the presentation the 2017 closure, the development of activities for the period 2018-2019 was analysed, a complete programme worthy of special mention due to its notable progress. Amongst the most rele-

vant actions, it is worth mentioning the celebration, for the second consecutive year in Bilbao, of the fair "World Metro & Light Rail", which enjoys its fifteenth edition and the 7th edition of Mafex "International Railway Conveniton". Regarding the

international fair Innotrans 2018, which hosts this month the city of Berlin, it was indicated that Renfe and Adif will support the Spanish industry forming part of the Mafex stand in this important professional platform worldwide. 

The second edition of the fair

Rail Live! in Bilbao is being organized



The next edition of the fair Rail Live! once again selects Bilbao for the second consecutive year. Within this framework it will be held the 15th edition of the congress "World Metro & Light Rail. The coming 6 and 7th of March 2019 will be attended by representatives from all over the world to analyse the present and future of urban rail transport. In this important international event there will be an exhibition area where you can learn first-hand about the innovations presented by the industry. In turn, the congress' schedule

FOLLOWING THE WARM WELCOME OF THE FAIR AND CONGRESS IN 2018, BILBAO WILL BE THE HEADQUARTERS, ON THE 6 AND 7 OF MARCH 2019.

will host a panel of conferences that will include the participation of executives and managers of the sector from around the world. All this will be completed with an extensive programme of activities and technical visits Following the positive results of the 2018 edition, with more than 150 international speakers, 110 exhibitors, and the the attendance of almost 2000 visitors, the organisa-

tion has already launched this new fair with the opening of the reservation period of exhibition spaces and registrations. On this occasion it will again have the backing of the Mafex, in the organisation of the event, as well as that of the Basque Government. The SPRI Group, ETS, Euskotren and Metro Bilbao support its development; as well as the collaboration of Adif and Renfe. 

Mafex continues to grow with the incorporation of three new partners

The Spanish Railway Association continues to expand. Three new companies have recently joined Mafex: Converzar, Ingeniería Tria and Flexix.

THREE NEW COMPANIES HAVE BECOME MEMBERS OF THE SPANISH RAILWAY ASSOCIATION, WHICH NOW BOASTS 85 COMPANIES AND STRENGTHENS ITS EXPANSION.



► CONVERZAR

Converzar is a company dedicated to distribution and converting of adhesive tapes, abrasives and liquid adhesives. Amongst its main lines of business are the distribution of adhesive tapes, liquid adhesives and abrasives; converting and manufacture of adhesive materials where the company offers comprehensive solutions from design, development, prototypes and series phases, to the application phase of our product, also offering automation options. Converzar also provides a large parquet of last generation machinery of: Laminators, Lathes, Cutters, Stamping machines, CNC and Laser cutting and engraving.



► FLEXIX

The company develops, manufactures and sell worldwide Injection and extrusion rubber parts, rubber-metal, rubber-plastic and assemblies. Flexix belongs to Kächele-flexix Group, with plants near Stuttgart and Munich (Germany), Zamudio (Spain) and a logistic warehouse in Houston (USA). Its products for the railway sector, are mainly for infrastructures, absorption of vibrations under track, tie pads for sleepers, with different stiffness, new developments, materials, competitiveness, non-conductivity (or yes, if necessary), non-harmful gases.



► INGENIERÍA Y TÉCNICA DEL TRANSPORTE TRIA

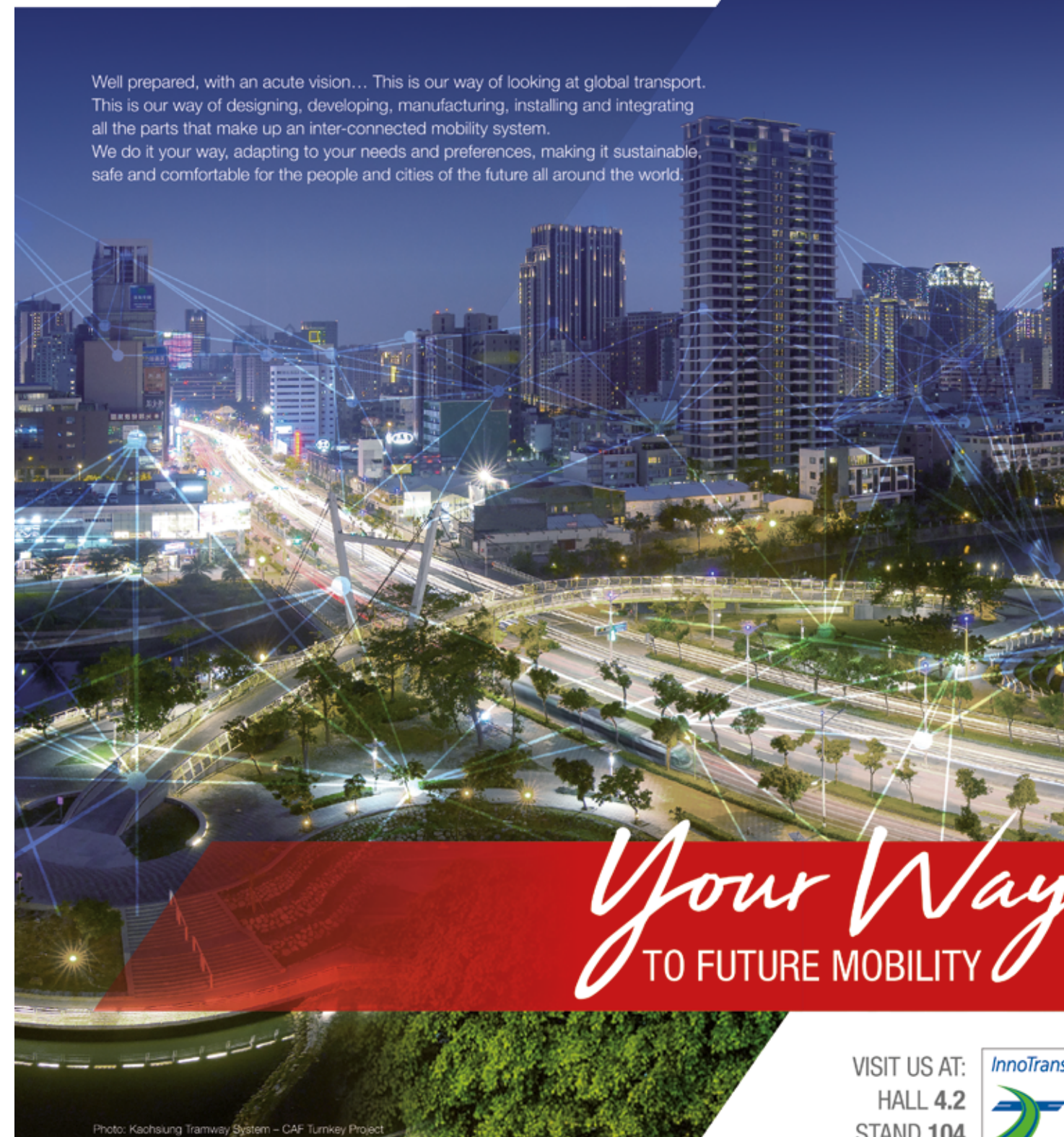
TRIA started with a core of railway engineers, providing solutions for automatic gauge changing technologies. They were demanded EPC type solutions that included civil works, fabrication of mechanisms, electrical engineering and installations, automation and control, track & catenary, communications, signalling, etc. Thus, the company eagerly became railway infrastructure and rolling stock experts. They built its own workshops, acquired railway machinery and above all, they have put together, a highly motivated, and qualified human team.



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Photo: Kaohsiung Tramway System - CAF Turnkey Project

ArcelorMittal receives Ecovadis Gold rating for CSR

ARCELOMITTAL

ArcelorMittal is awarded the Gold Recognition Level based on its EcoVadis sustainability rating, which places the Company as a reference supplier within the railway sector. Ecovadis is the first independent collaboration platform that evaluates the quality of the CSR management system of railway industry suppliers. Framed in the international initiative "Railsponsible", the objective is to facilitate the integration of sustainability criteria in the relationships between customers and suppliers. Railsponsible – using the Ecovadis platform – looks at company performance across 21 criteria under four themes: environment, labour practices, fair business practices and sustainable procurement, not only using suppliers' submitted answers and materials,



but also publicly available information and news. The methodology is built on internationally standards,

including the United Nations Global Compact, ISO 26000 and the GRI-Global Reporting Initiative.

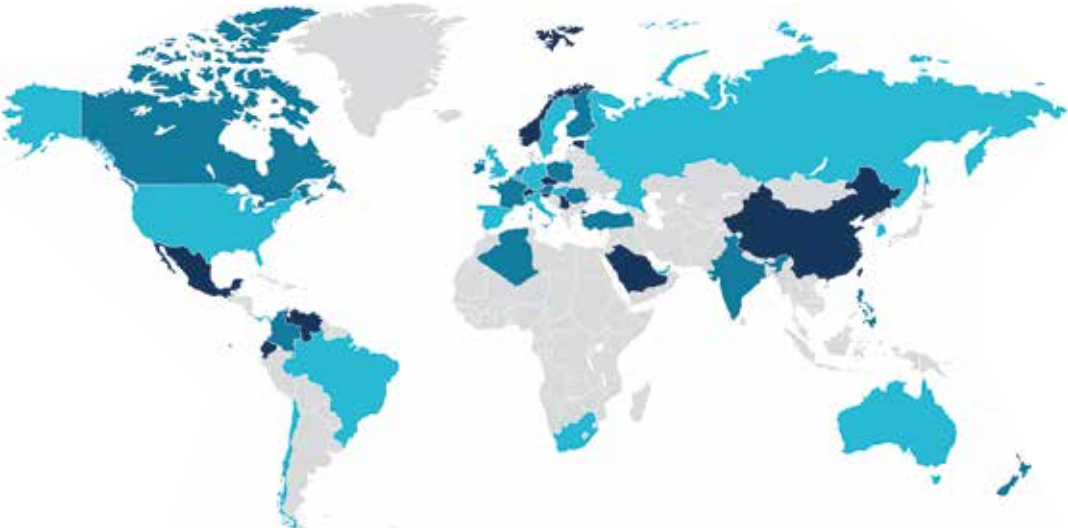
CETEST: Anywhere, Anytime

CETEST

CETEST still demonstrates its global deployment capability in rail testing. In the last months diverse test campaigns have been executed around the globe: From New Zealand, for CAF's Canberra tram validation, through South Africa, where Transnet will use the instrumented wheelsets that are being developed, right up to Santiago de Chile CAF's Metro, CETEST serves anywhere, anytime. Likewise, testing engineers and technicians have moved to USA in order to perform different tests in Boston (CAF), El Paso (Brookville) and also New York, for instrumented wheelsets' set up and

installation (Kawasaki). To the same extent, in India CETEST has managed and executed diverse trials at Calcutta and Bangalore Metros (BEML), and at Delhi Metro (Hyundai-Rotem). Also in this country, the requested instrumented wheelsets are being developed for Alstom's electric locomotive. Last but not least, CETEST is also carrying out consultancy work as

testing expert for Bureau Veritas and Lucknow Metro. Finally, highlight the service that CETEST continues to provide in Europe, such as the M7 campaigns in Belgium (Bombardier), the consultancy work for Belgorail in Luxembourg, or the Caledonian Sleeper, Arriva Civity or TransPennine campaigns in UK for CAF.



GMV renews TMB's onboard video surveillance system

GMV

Transports Metropolitans de Barcelona (TMB) has once again turned to GMV for renewal of the metro's onboard CCTV system; a uniform system fitted on 149 trains of 8 different series and including 300 video recorders, 300 communication nodes, 600 antennas, 760 video coders, 740 Ethernet switches and 540 IP cameras; plus 2038 analog cameras. The digital recording equipment captures images in Full HD resolution, with the capacity of replay and simultaneous exporting, real-time train-to-ground video



transmission and display from the TMB control centers, with ONVIF compatibility. The digital cameras have infrared lighting

for recording in nil-illumination conditions, while the system has a built-in onboard monitor for real-time supervision.

Alstom, first company to get the ISO 45001 Occupational health and safety management certification in Spain

ALSTOM SPAIN

Alstom is the first company in Spain to receive the ISO 45001: 2018 Occupational Health and Safety management certification. This certification has been issued by the National Entity Accreditation (ENAC www.enac.es). The new ISO 45001:2018 published in March 2018 by the International Organisation for Standardisation body (ISO), confirms excellence and good practices in Occupational Health and Safety Management Systems. This new standard puts special emphasis on prevention systems and on the companies' global commitment for the development of a culture of prevention and continuous improvement in this field. This new norm goes beyond health and safety traditional topics, making also reference to broader issues, such as labor welfare. The new ISO 45001 standard replaces the previous OH-SAS 18001:2007 standard, currently the most widespread for Health and Safety at Work management. The ISO body has introduced a 3-year



From left to right, Laura Lázaró (Environmental and Occupational Health and Safety Policies Manager Alstom Spain), Carlos Navarro (Head of Sales DNV GL) Boris Symchowicz (Managing Director of the Signalling and Infrastructures Unit at Alstom Spain), Ana del Río (Senior Auditor ISO 45001 DBV GL) and Antonio Almodóvar (Regional Sales Manager DNV GL).

transition period for companies to upgrade their certifications. Alstom is the first one to be certified in the Spanish market and is also one of the first globally.Obtaining ISO 45001 guarantees that the company has

implemented, among other requirements, a high-level structure with an adequate context analysis, as well as a clear focus on risks and opportunities for Workers' Health and Safety management.

Bombardier Spain to lead company's projects in Sub-Saharan Africa and Middle East

BOMBARDIER TRANSPORTATION SPAIN
Bombardier Transportation has decided to put Bombardier Spain's management team in charge of the railway projects in Sub-Saharan Africa and Middle East. Óscar Vazquez, president in Spain and Portugal, leads this team. With this decision, the Canadian company emphasizes its confidence in the team of Bombardier Spain. The management team of Bombardier Spain has extensive international experience with its president, Óscar Vázquez, at the head, who over the last years has held positions of responsibility in Spain, England,

Austria, Singapore and Switzerland. His extensive knowledge of the di-

fferent areas of the business will be key to the development of the Spanish, African and Middle East railway market. Bombardier has two centres of excellence in railway engineering located in Spain: one for the development of signalling systems in San Sebastián de los Reyes (Madrid) and another one for propulsion systems in Trápaga (Basque Country). In Spain, all public railway operators have products developed by Bombardier, where more than 800 employees currently work.



COMSA begins construction on the Odense tramway (Denmark)

COMSA
COMSA leads the construction of more than 14 kilometres of dual track tramway between the districts of Tarup Centre and Hjallesø as well as the 26 stations that will comprise the line. The contract is

valued at 158 million Euros and includes the building of the catenary, signalling work, telecommunications and a control and maintenance centre. The Odense tramway is being built using sustainability criteria. In this line, anti-vibration blankets and rail jackets will be used for attenuating the noise and oscillations generated

by the operation of the trains. On the other hand, the maintenance centre will be energy self-sufficient. To accomplish this, over 500 square metres of solar panels will be installed on the roof, windows and skylights will be installed for natural lighting as well as efficient thermal insulation that will result in savings in the energy bill.

Icon Multimedia introduces deneva, its passenger information system on metro Medellín

ICON MULTIMEDIA
ICON Multimedia has now enabled 24 digital information screens that runs with DENEVA Passenger Information System. Those are located in 7 stations in line B, which connects San Antonio with San Javier. These are high-end industrial monitors located in strategic spaces with greater traffic, which show real-time information of the train arrivals and departures; information about the Culture Metro, among others, to improve the passenger experience. These visual information systems is part of Metro Medellín project, called Citizen Information Center (CIC), which includes different channels like social networks. It also includes digi-



tal displays of the bus stations of line 1 and tram stops of Ayacucho and the Metrocable Orienten. Also, by the end of this year, external screens will be put into service at

the stations of lines A and B. These screens will be located on footbridges or pedestrian bridges on line A stations, while on line B they will be close to the accesses.

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Dublin MetroLink, a technological landmark

IDOM
Every new Metro System Project is a unique opportunity to distinguish a city. Following a challenging competition with other top international firms, IDOM has won the confidence of Transport Infrastructure Ireland (TII) and the National Transport Authority (NTA) and is now designing Metrolink, the first metro system in Dublin, a European capital with a rich historical, urban and cultural heritage. Together with Jacobs, we are developing the design of systems engineering, civil engineering, stations, railway systems and rolling stock. Our extensive experience in similar projects around the world means that we can apply innovative design criteria with the clear objective of optimizing investment, operations and the user experience. Given its intrinsic characteristics, Metrolink is a one-of-a-kind project.



Part of the IDOM team working on the project, Gonzalo Tello (Architect), Jorge Bernabéu (Civil Engineer, Project Director) and Rebeca Sánchez (Civil Engineer, Alignment Expert).

This new line stretches for 26.4 km and has 26 stations, including 11.5 km configured in tunnels and 3 km running on viaducts. 8.6 km and 10 stations of the existing LUAS tram infrastructure will be upgraded to the Automatic Metro standard (GoA

4), the standard to be used on the entire Project. BIM Level 2 is the design technology being used across all disciplines. In short, Metrolink will integrate the most advanced and current technologies, to deliver a state

New fire retardant plastazote® foams for insulation applications in trains, trams and undergrounds with classification according to EN45545 HL1/ HL2/ HL3

ZFOAM
Some foams of the range Plastazote® with low density FR additives have obtained excellent results in accordance with EN 45545-2:2013. The classification is:

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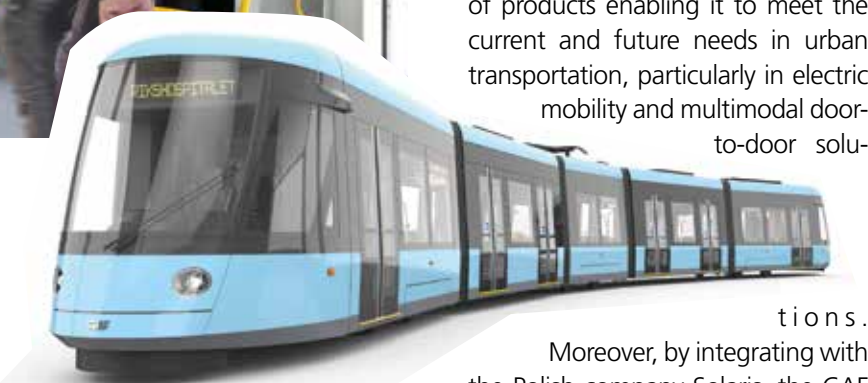
- Easy adaptability to curved surfaces.
- Excellent properties for cutting and machining process

These products have been specifically developed for applications in climates with extreme temperatures and problems of water vapor condensation.



CAF makes progress in the international market

CAF
On July 4th CAF welcomed an invite from HS2 Ltd to join the list of companies invited to participate in their procurement programme for state-of-the-art high speed trains to operate on the UK's new high speed net-



work and beyond. Operating at speeds of up to 225mph (360kph),

the new fleet will deliver unparalleled levels of reliability, speed and comfort as well as providing much-needed extra capacity between the UK's major cities and giving a boost to high tech skills and expertise in the UK. On the other hand, Sporveien, the public operator for all urban transport in the Norwegian capital has given notice that CAF's bid has been selected for the contract for the supply of 87 trams. The contract volume will exceed 200 million euros, whilst a possible extension of a further 60 trams will also be considered. CAF has also decided to take an important step within its Strategic Plan, on the road to European leadership in sustainable urban mobility systems. Together with Solaris, CAF will broaden its already extensive range of products enabling it to meet the current and future needs in urban transportation, particularly in electric mobility and multimodal door-to-door solu-

tions. Moreover, by integrating with the Polish company Solaris, the CAF Group will become one of the market leaders in the bus segment.

SmartRail World Innovation Awards 2018: Galgus awarded in Amsterdam

GALGUS
Galgus has been awarded in the "Operational Performance Innovation of the Year" category. The jury acknowledged its CHT distributed, self-optimized, multiplatform, cognitive software for maximizing the performance and operation of on-board Wi-Fi networks. The awards are given within the SmartRail Congress, an event organized by SmartRail World, which is the online home of cutting edge rail and metro technology. "For Galgus, being named winners of the SmartRail Innovation

Awards 2018 represents a huge support to what we've been developing to improve on board con-

nectivity in the railway sector", said Pedro Garcia, Galgus' Head of Marketing.



KVB switches on to LED in Cologne's metro

LUZNOR

The Kölner Verkehrsbetriebe (KVB) chooses Luznor's new LR series torch to use in the underground railway network of Cologne.

The model LR-KVB, which carries their name and logotype, contains the new LED technology as main light source and a combination of red and yellow LEDs as rear signalling functions.

Besides, the torch has three levels of constant lighting and three types of intermittency on the front part.

Luznor used the most modern technology in its design and construction in order to achieve both a pleasant ergonomics and aesthetics as well as great resistance and reliability.



Indra and Greenrail cooperate in the development of smart rail ties

INDRA

Indra and Greenrail, Italy's startup of the year specialized in the production of eco-sustainable ties, have signed a collaboration agreement today to jointly develop products and innovative technology systems for the rail transport sector.

Indra and Greenrail will study the technical and economic viability of the development of an innovative model of sustainable and smart ties, capable of collecting, processing and sending real-time data to the railway traffic control centers on the status of railways and trains.

The integration in Greenrail's sustainable ties of Indra's state-of-the-art systems opens the doors to new predictive maintenance functionalities, resulting in cost savings for implementation and energy and



improving security, among other advantages.

Furthermore, the objectives of the agreement also include the joint development of other solutions and products aimed at the rail industry, as well as pilot projects for customers and R&D centers. Both companies

will assess the applicability of Greenrail technology as a complement to Indra's most advanced solutions for rail transport; exchange knowledge and disseminate the results and developments achieved through publications, conventions and other forums.



Emergency lighting system for metro tunnels of Santiago line L1 and L2 (Chile)

SICE

Metro de Santiago has trusted to SICE the adaptation and standardization of the emergency lighting system of the inter-stations of lines 1 and 2.

SICE will provide an emergency lighting system for tunnel interstations whose main function is to light the evacuation routes while a blackout happens. It complies with the Chilean electric standard that establishes an lighting emergency condition of at less 1 Lux at floor level.

The works are intended to improve and standardize the emergency lighting system to protect the safety of passengers while an evacuation. Both luminaires and the installation procedure will serve as reference for future projects.

- Security and Communication systems for metro and railway infrastructures
- Automatic Fare Collection
- Railway Signalling

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The French Industrial Group Satys buys Kelox a leader in galley systems for railway

KELOX

On May 24th 2018 Satys bought the Spanish company Kelox which was founded in 1959 with locations in Madrid and Pennsylvania (USA).

Kelox is specialized in rail equipment through the design and supply of galley systems and the provision of related services to builders of rolling stock and railway operators worldwide. Main core business activities are refrigerated systems, stainless steel equipment and interior developments by carrying out turn-key projects.



In Madrid, Kelox has a design and engineering office, a 2000 m2 factory and a test laboratory with Iris and EN 15085 certifications. Among its main customers are Alstom (the company recently chosen by Alstom for the Amtrak project, high speed trains in North America), Hitachi, Siemens, Talgo. Kelox will strengthen and complete

the Satys Interiors Railway division (formerly SMTCT).

The activities were regrouped under the name Satys when the Finaero group's name was changed in March 2018.

- Satys Sealing & Painting: aircraft painting and sealing, aerostructures & rail equipment.
- Satys Interiors: design and fabrication of aircraft and rail interiors.
- Satys Electric: wiring and cabling assemblies for the medical, energy and aeronautic industries.
- Satys Surface Treatment: surface treatment for aeronautical components.



SENER renews its Board of Directors

SENER

Jorge Unda, until now the Managing Director of the Engineering and Construction area of the SENER Group, has been appointed CEO for the entire Group, replacing Jorge Sendagorta. Therefore, Unda becomes the top executive of the company and Sendagorta remains as President of SENER's Board of Directors. Besides, Jorge Sendagorta Cudós has been appointed Managing Director of Engineering and Construction. This area covers various business

units, such as Infrastructures and Transport, where César Quevedo



has served as General Manager since 2017. The challenges facing the new Board of Directors include the development and international expansion of the company activity and the future trends in mobility and transportation, due to expanding urban areas and the rise of the so-called 'smart cities'.

SENER offers high-tech solutions for urban and interurban transport, using cutting-edge technology (BIM and its own, specific software). It provides comprehensive integral engineering services and Railway Systems Integration (RSI).

Istanbul metro and Odense and Palembang trams rely on Teltronic for their TETRA communications system

TELTRONIC

Teltronic keeps on expanding its business over transport sector and, in the last months, it has announced its involvement in three important projects.

The Spanish company is responsible for providing a TETRA communications system for Istanbul Metro's new line, UCC, which for the first time in Turkey, will host driverless trains.

In addition, Teltronic has been selected to supply a complete radio communications solution for a LRT project in the city of Palembang, which is planned to be the first one in Indonesia.

Finally, Teltronic will provide a TETRA system for Odense's light train, that



means the first deployment of the company in Denmark.

These projects reveal how operators and integrators maintain their con-

fidence in TETRA technology and in Teltronic's infrastructure, NEBULA, that has already proven their reliability and robustness worldwide.

Egyptian Railways rely on thales to double the number of trains on the busiest section of the Cairo-Alexandria line

THALES SPAIN

This project will improve traffic safety and security to allow trains to travel at a speed of up to 160 km/h, as opposed to the current 120 km/h. Current traffic volumes are also expected to double. All of these changes will increase passenger and goods capacity on the backbone line that links the North and South

of the country from Alexandria to Cairo and all the way to Aswan.

The Cairo-Benha section consists of 9 stations and 48 km of tracks and carries some of the busiest traffic on Egypt's railway network. Thales will extend to this section its signalling technologies that are currently being implemented on the Benha-Alexandria section of the line. Harmonisation of signalling technology along the entire Cairo-Alexandria corridor will ensure that ENR masters every decisive moment of the operation of this heavy traffic line.

This extension includes the supply of new signalling technologies such as 9 electronic interlocking devices, 11 level crossings and field elements, and also the interface to existing assets.

The scope of the Thales contract also includes the overhaul of associated energy systems, refurbishment of existing technical buildings and construction of new ones in different locations. With this extension, the traffic control centre will be able to manage the whole line from Cairo to Alexandria.





New orders of the new locomotives generation developed by Stadler
STADLER RAIL VALENCIA
Stadler Valencia, the French rail freight operator VFLI and the leasing

company Alpha Trains announced last June the signing of the purchase contracts for the first 12 EURO4001 diesel-electric locomotives and the prototype of the EURODUAL bi-mode locomotive. Both models are part

of the new generation of six-axle locomotives developed by Stadler Valencia for the European market. The 13 new locomotives will be used by VFLI in rail freight transport services in France and Belgium. This order is added to the 10 EURO-DUAL locomotives ordered by the German operator HVLE that is launched in InnoTrans. The powerful locomotives are to be used in freight transport services in Germany combining both operating modes: electric and diesel. They can run on electrified lines rated at 7,000 kW, but they are also powered by a CAT C175-16, IIB engine rated at 2,800 kW to run on non-electrified lines. The EURODUAL is the technological response of Stadler to the challenges posed by cross-border corridors. With its avant-garde technology, it covers every need in an efficient and reliable way offering rail operators numerous economic and ecological benefits.

Another landmark project in Viet Nam: Hanoi metro line 3
TPF GETINSA-EUROESTUDIOS

Last June 15th, 2018 TPF Getinsa-Euroestudios started working on the Ha Noi Pilot Light Metro Line project as the Consultant for Project management Support (Phase 2) for the construction of Line 3. The Project includes the civil works, rail systems, supply of rolling stock, and automatic fare collection for a new metro line 12.5 km long, consisting of 8.5 km of elevated viaduct and 4 km of tunnel, 12 stations (8 elevated and 4 underground), and the maintenance depot. The total investment, which amounts to €1,127 million, is financed by the Asian development Bank (ADB), the European Investment bank (EIB), the French Government (DGTresor), the French Agency for Development (AFD), and the Government of Viet Nam. As this is one of the first metro Lines in Viet Nam, the mission of TPF GETINSA – EUROESTUDIOS is to pro-

vide expertise to the Client, Hanoi Metropolitan Railway Management Board, in all fields related to metro line construction, encompassing general project management, financial

management, tunnelling, railway systems, environment and occupational safety, resettlement, gender, and communications. The contract duration is four years.



Ferrocarrils de la Generalitat Valenciana upgrades and expands its network

THE PUBLIC COMPANY OF THE REGIONAL GOVERNMENT OF VALENCIA RESUMES THE LINE 10 METROVALENCIA. WORKS. THE NEW ACTIONS HAVE ADOPTED THE 2017-2023 UNIVERSAL ACCESSIBILITY PLAN OF THE PUBLIC COMPANY.

Ferrocarrils de la Generalitat Valenciana (FGV) maintains as its primary objectives the continuance of the upgrading and expansion of the Metrovalencia and TRAM d'Alacant (Alicante Metropolitan TRAM) operations. Likewise, adopting as a reference benchmark for its actions the implementation of the 2017-2023 Universal Accessibility Plan presented by the Regional Government's public company last year. The large-scale projects in this term will help upgrade the connection between Benidorm and Dénia of Line 9 of the TRAM d'Alacant (Alicante Metropolitan TRAM), and will undertake the execution of Metrovalencia Line 10, which will connect the town centre of the capital with the maritime neighbourhood of Natzaret. Furthermore, FGV's new Universal Accessibility Plan is the framework which stipulates, orders and promo-



tes all the initiatives that the company undertakes in order to meet the requirements of the organisations which represent groups with physical or mental limitations. These are organisations have taken part in the drafting of this document. The proposed measures are modelled on the principles of equality, dignity, increased autonomy, comfort and safety for people.

Commencement of Line 10 works

Following the award of technical assistance contract for the drafting of the studies and projects of Metrovalencia Line 10, FGV will be able to resume in 2019 the construction of this line, whose construction works have been suspended since 2011. The route, between the centrally located street of Alicante and Natzaret, which will run through a top tourist destination such as the City of Arts and Sciences, and the Oceanogràfic Valencia ("The Oceanographic" oceanarium). The President of the Valencian Regional Government, Ximo Puig, recently announced that the Valencian Government had mobilised the Line 10 situation with an initial investment of 50 million Euros, of which 30 million Euros will be contributed by the Regional Government and 20 million Euros coming from the European

Union, through the 2014-2020 Operational Programme of the European Regional Development Fund (ERDF) of the Valencian Community.

TRAM d'Alacant (Alicante Metropolitan TRAM) Line 9 Actions

Line 9 of the TRAM d'Alacant (Alicante Metropolitan TRAM), in particular the section between Benidorm and Dénia, plays a pivotal role for public transport in a coastal area with high tourist potential. FGV is currently addressing several actions, such as track renovation, retrofitting of bridges and embankments, rolling stock improvements, improvement to security, communications and energy facilities, as well as the tram-train line project for the access gate to the city of Dénia. Following the renovation of the route between Calp and Teulada, the route to Dénia will be executed in 2019. From among the initiatives underway or planned, the Valencian Regional Government's investment in this TRAM d'Alacant (Alicante Metropolitan TRAM) line exceeds 120 million Euros. FGV awarded to Stadler Rail Valencia, with registered office in Albuixech, the construction of six mixed trains (electric and diesel) to cover Line 9 traffic, for an amount of 43.3 million Euros.



Germany

a consolidated rail network

THE RAILWAY PLAYS A KEY ROLE IN CITIES, REGIONAL CONNECTIONS AND EUROPEAN COUNTRIES, AS IT ENJOYS STRONG DEMAND LEVELS AS A MEANS OF TRANSPORT.



GERMANY

Germany, with an area of 357,050 km² and 81.7 million inhabitants, has a consolidated railway network of 43,468 kilometres, the largest nation in the European Union and the sixth worldwide. Its strategic location, as well as its commitment to modern modes of transport, means that it is at the forefront in the incorporation of systems and new technologies that guarantee maximum safety, reliability,

energy efficiency and respect for the environment and surroundings. The German rail market is characterised by its maturity, with extensive and modern networks. The railway plays a key role in cities, regional connections and European countries, as it enjoys strong demand levels as a means of transport. With regard to its structure, a characteristic of this railway industry is the co-existence of a large number of

medium-sized companies, suppliers of components and electrical or automatic systems. On the one hand, there are the State-run companies, subsidiaries of the Deutsche Bahn group that own most of the commuter, freight and long-distance transport service (DB Regio, DB Cargo, DB Fernverkehr) and boast more than 4,200 customers in Europe. It is the supplier of one of the largest rail networks in the world, with around 80% of the market share of total merchandise traffic and 99% of total long-distance passenger traffic in Germany and 74% of commuter rail.

Railway operators

In addition to Deutsche Bahn, more than 150 private companies operate on the German network. The S-Bahn Stadtschnellbahn serves the main suburban areas and Hamburg Cologne Express (HKX) is the second largest long-distance passenger operator. These are joined by the companies of the federated states, the municipal ones, as well as those of third countries that work (Schweizerischer Bundes Bahn, owner of SBB Cargo Deutschland, Trenitalia who absorbed TXLogistico, and the French company SNCF through its subsidiary Captrain. In terms of private companies, there are five that are the most prominent (Mittelwesery RC4 handle freight transport and Veolia, Arriva and Abellio carry passenger traffic). In 1994, a smooth and gradual liberalisation process was opted for. In this way, the national company, Deutsche Bahn yielded around 25% of passenger traffic to the private sector. Also, DB maintains its activities in the lines of national scope and the maintenance of the infrastructure continues to be entrusted to the state. In recent years, the opening up to competition has also commenced in interurban and suburban rail transport.

Investment master plan

The German Ministry of Transport has a long-term infrastructure master plan in place. This is the "2030

MAIN DATA REGARDING THE GERMAN RAIL NETWORK (2017)

PASSENGER TRANSPORT	
Passengers (millions)	2,564
Passengers in Germany (millions)	2,075
Long distance passengers (millions)	142.2
Passengers per day (millions)	7.0
Trains per day	24,189
INFRASTRUCTURE	
Track (millions of train-km of track)	1,073
Network throughout Europe (DB Netze Track)	33,488
Tunnels	741
Railway bridges	25,156
Stations and stops (millions)	153,2
ROLLING STOCK	
ICE fleet (number of trains)	271
S-Bahn (Metro) dc	830
S-Bahn (Metro) ac	990
Multiple diesel units	2,095
Tramways	51
Locomotives	1,378
Railway passenger coaches	5,902

Source: DB Group, Facts & Figures 2017

Federal Transport Infrastructure Plan" or FTIP. This roadmap includes both the investments required for structural maintenance and infrastructure repair, as well as another 1,000 modernisation and construction projects. In total, this new program has been granted financing of 269.6 billion euros for high quality transport networks. Of this amount, the actions for the improvement of the railway system represent 41.6%, with the main priority in the structural maintenance of the existing network. Amongst the aims, reduce bottlenecks, increase transport capacity, reduce waiting times and continue with the processes of digitisation. The list of railway projects highlights especially the extensions of high-speed networks, as well as modernisation, electrification and duplication of routes. To accomplish this, 40.456 billion euros has been set aside, as detailed in Annex II of this State Plan.

In turn, the DB Group has also launched the "DB2020 + strategy", a programme in which it establishes

the priorities to face the growing traffic flows in Europe. To this end, the company continues to advance in areas such as station modernisation, digitalisation, timekeeping, energy efficiency, etc.

The German state railway operator will raise investment in its infrastructure this year, as part of the boost it wishes to give its network to achieve efficient, comfortable, punctual and modern services. The group plans to spend a "record sum" of 9.3 billion euros on upgrading, repairing and expanding roads, stations, bridges



and tunnels. This figure represents an increase of 9.4% compared to the previous year.

Amongst the most relevant projects are the overhauls of the main routes, such as the sections linking the northern ports of Bremen and Hamburg with the cities further south, and two lines that cross the southeast border of Germany with Austria. In addition, some 700 stations, including Frankfurt and Magdeburg, in eastern Germany, are also included in these improvement projects, with a budget of 1.2 billion euros.

FTIP PLAN: NEW FEATURED PROJECTS

PROJECT	BUDGET ALLOCATED (B€)
Improvements on the Nuremberg-Erfurt line	1.143
Improvements in the Hamburg-Lübeck-Puttgarden line	1.517
Modernisation of the network: Nuremberg - Marktreidwitz	1.194
Modernisation of the Hanau section - Würzburg / Fulda- Erfurt / construction of a new high-speed line	4.252
Modernisation of the Hamburg-Hanover line	3.890
Modernisation in the "Middle Rhine" corridor	4.394
Modernisation of the Karlsruhe-Basle line / construction of new high-speed line	6.394
Modernisation of the Munich-Mühldorf-Freilassing line	1.140
Improvements in the Rhine-Ruhr route Express (RRX): Cologne-Düsseldorf-Dortmund / Münster	1.844
Modernisation of the Ulm-Augsburg line / construction of new high-speed line	1.907
Improvements to the main connections (Cologne, Frankfurt, Hamburg, Mannheim, Munich)	2.500



A master plan to foster freight transit

The Federal Government has as a priority to reduce road traffic, as part of its commitment to respect the environment, and to promote thus more competitive rail freight transport. In order to increase market share and strengthen the sector, the "Plan of Impulse to the Railway Freight Transport 2017-2023" has been drawn up. Amongst the measures approved, the Federal Executive will significantly reduce the costs of access to operators.

In addition, it will invest in the expansion of the infrastructure, with additional tracks that facilitate the circulation of longer trains; in digitalisation and automation and innovation. The new routes and extensions planned are the following: the Rhine regions, NBS Rhine / Main-Rhine /

Neckar, East Corridor and Ruhr-Sieg, while the main established corridors connecting Hamburg, Cologne, Frankfurt, Ludwigshafen / Mannheim / Heidelberg / Karlsruhe, Munich and Hanover. To this are added

the improvements envisaged in the "Master Plan" of the company DB Cargo, which, among other actions, will overhaul its fleet with the acquisition of 100 new locomotives and 4,000 additional wagons.



SOME MAFEX MEMBERS WITH PROJECTS IN GERMANY



ARCELORMITTAL
ArcelorMittal is one of the selected suppliers of Deutsche Bahn for its network renewal and expansion programs. Deliveries include 120m rails, suitable for high-speed trains, providing high safety standards due to a reduced need for welding. Beyond the delivery contract, ArcelorMittal and DB are also cooperating to develop new rail products together. Rails delivered by ArcelorMittal renewed 20km railroad track between Rostock and Wismar in East Germany. This line secures public transport in the region and provides the infrastructure for long-distance freight transport from and to the port in Wismar.

GALGUS
GALGUS, worldwide leader developing embedded software for WiFi network optimization, and ELTEC, one of the most prestigious WiFi access point manufacturer for rail, have concluded the integration of Galgus CHT software with ELTEC WiFi APs Cybox AP 2-W and Cybox AP-W. Customers using these APs, or buying new units, will be able to install Galgus CHT software on them, increasing the WiFi throughput by intelligent distribution of WiFi clients, adding remote cloud management to the APs, additional anti-hacking security WIPS/WIDS, fast roaming between access points, WiFi client location, etc.



LUZNOR
The Berliner Verkehrsbetriebe (BVG) updates the cabins of their metro vehicles with the latest Luznor LR series torch. The model LR-BVG, which carries their name and logotype, contains the new LED technology as main light source and a combination of red and white LEDs as rear signalling functions. Besides, the torch has three levels of constant lighting and three types of intermittency on the front part. Luznor used the most modern technology in its design and construction in order to achieve both a pleasant ergonomics and aesthetics as well as great resistance and reliability.



ALSTOM SPAIN
Alstom Spain will supply 38 Citadis trams to Stadtwerke Verkehrsgesellschaft Frankfurt am Main (VGf), the transport operator in Frankfurt, Germany. All the trams, with special adaptations for the German market, will be manufactured at Alstom industrial site in Santa Perètua (Barcelona) .

The Citadis for Frankfurt is a 100% low floor vehicle, offering superior passenger experience with large glass surfaces, LEDs for soft, homogeneous lighting, large individual seats and travel information on large screens. It includes innovations such as driver assistance systems, automatic dipped beam, and rain sensors. The three-car tram

will be 31.5 metres long with a maximum capacity of 197 passengers. Double-doors along the entire length of the tram ensure enhanced accessibility. Special adaptations for the German market include four pivoting bogies to allow maximum vehicular flexibility, and carriages made of steel.

LANDER
Simulators have proven to be the essential piece in training new drivers. One of the most recent examples is the project completed by the German operator Rhein-Neckar Verkehr (RNV). In 2016, RNV awarded LANDER with not only a contract for an ambitious training centre project but also its full trust in that both companies would be capable of the corresponding 18-month journey. This venture culminated recently with the installation of 3 simulators, which will work with Germany's largest public transport alliance to provide support in training drivers who transport thousands of people every day.



SOME MAFEX MEMBERS WITH PROJECTS IN GERMANY



BOMBARDIER TRANSPORTATION SPAIN

Bombardier Trápaga’s factory is currently developing the traction converters for the propulsion systems of the TRAXX AC3 locomotives that Bombardier has been supplying in recent years to the German Railways, DB, after signing a framework agreement, valid until 2020, for the

supply of 450 electric locomotives. Currently, Bombardier Spain has supplied 66 traction converters out of a total of 136, for this locomotive version. This version belongs to the most modern four-axle locomotive platform in Europe. It consists of the TRAXX AC3 (alternating current), the TRAXX MS3 (Multi-System, for all main currents in Europe)

and the TRAXX DC3. Precisely this platform is the one that Bombardier would be analyzing for the possible tenders contemplated within the Plan of Impulse to the Railway Freight Transport 2017-2023. The 'Last Mile' traction mode allows connecting non-electrified track sections, compensating for possible power failures.



SIEMENS

A 23-kilometer-long section of the S-Bahn Line 21 between the Berliner Tor and Bergedorf/Aumühle stations will be equipped for fully automated operation as well as the four trains that will run along this section. The project is foreseen to be concluded in October 2021 when Hamburg hosts the World Congress for Intelligent Transport Systems (ITS). The agreement for this first phase, considered as a pilot, has been signed recently by Deutsche Bahn, the Free and Hanseatic City of Hamburg and Siemens. The technical basis for the highly automated operation on the line is the future European Automatic Train Operation (ATO) standard via the radio-based European Train Control System Level 2 (ETCS).

PROJECTS IN GERMANY

STADLER RAIL VALENCIA

Stadler has participated in numerous projects in Germany supplying the rolling stock. Specifically, Stadler Valencia has supplied more than 100 light vehicles to different German cities including the 13 trams 100% low floor TRAMLINK of Rostock. AVG and VBK, the local operators of Karlsruhe, have purchased a total of 75 LRV from the CITYLINK family and Verkehrsverbund Mittelsachsen 12 bi-mode tram-trains of the same family to connect the tram network of Chemnitz with its commuter rail network without transshipments. In addition, Stadler Valencia has manufactured the bogies and coaches of the Wuppertaler Schwebebahn suspension train. Regarding rail freight transport, the German operator HVLE has become the launch customer of the EURODUAL, the new generation of six-axle bi-mode locomotives developed by Stadler.



CAF

In 2013 Freiburger Verkehrs-AG, the public transport authority for the city of Freiburg awarded CAF the supply of 12 Urbos low-floor tramways. The units, composed of seven modules each, haven been providing revenue service for more than two years.

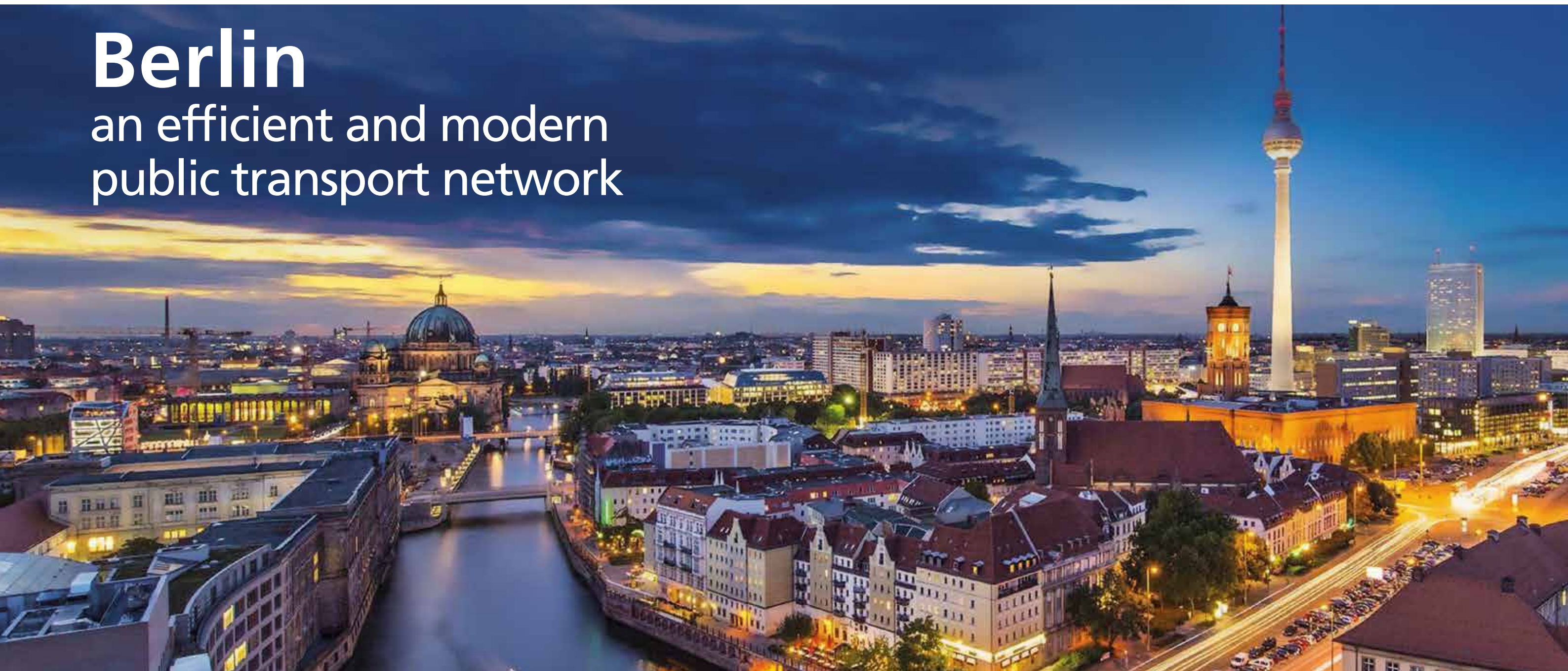
This year the German city has renewed its trust in CAF with a new award of 5 additional units. This contract contemplates the eventual extension of the procurement with yet another 7 unit order. Furthermore, CAF is manufacturing new Light Rail Vehicles for Zweckverband

Schönbuchbahn (ZVS). The project includes the supply and maintenance of 9 electric units composed of three cars each. The units will run in the network operated by ZVS, specifically in the line connecting Böblingen, Holzgerlingen and Dettenhausen.



Berlin

an efficient and modern public transport network



THE CITY OF BERLIN BACKS A MODERN, FUNCTIONAL AND HIGH-CAPACITY PUBLIC TRANSPORTATION NETWORK.

Berlin is a multi-centre city with an extensive and accessible transport network. In addition, it has national and international rail connections of the highest standard. The city has a modern combined regional and suburban system of trains, subways, trams and buses covering a distance of around 1,900 kilometres. The main company in charge of its operation is BVG, which operates 73% of the 1.5 billion trips with more than 3,000 vehicles, 7,500 stops, and 186 lines within a radius of 892 square kilometres. Of all of them,

there are two key centres; namely the Berlin-Brandenburg Airport and Central Station.

Due to the fact the number of passengers is constantly increasing, programmes have been devised to respond to new demands, which also take into account aspects such as the environment, digitalisation and the incorporation of new technologies to achieve an intelligent mobility. The city-state of Berlin has embarked upon the plan "The Berlin Strategy." An Urban Development Concept Berlin 2030 "where sustainable urban transport is one of the

axes. The goal is to improve the overall efficiency of the system.

Metropolitan Rail Network

The Berlin Underground, U-Bahn, operated by the Berliner Verkehrsbetriebe (BVG), is the largest system in Germany and the fifth largest in Europe. Together with the commuter train (S-Bahn), whose commercial operation is in charge of S-Bahn Berlin GmbH, it forms the dense urban transport network of the city. The network has ten lines that connect 170 stations and total 146 kilometres in length. In addition, it

registers more than 1.4 million passengers a day. This metropolitan rail network is the fifth most important in Europe.

BVG continues with improvement plans to respond to the growing demand with the reinforcement of its rolling stock fleet or various improvements in the network, amongst other aspects.

These include the acquisition of 80 units to Stadler Pankow, in response to an urgent need to increase capacity in some of its lines. The first one is planned for the second half of 2019.

Tramway

The tramway network in Berlin is the fourth largest in the world after Melbourne, St. Petersburg and Sofia.

It has 22 lines offering a network of 300 kilometres and 802 stops. The city is investing in new branches among which are Alexanderplatz-Rathaus Steglitz, Potsdamer Platz-Schöneeweide, Potsdamer Platz - Johannisthal - Zwickauer, Turmstraße - Jungfernheid, Spittelmarkt - Mehringdamm, Anbindung Ostkreuz, Pankow - Weißens, are just some examples. 📍

SOME MAFEX MEMBERS WITH PROJECTS IN PUBLIC TRANSPORT IN BERLIN



SIEMENS SPAIN

The Siemens/Stadler manufacturer's consortium is right on schedule on the completed assembly of first half train BR 484 that will be transferred soon to the Stadler site in Velten, where it will be commissioned.

S-Bahn Berlin is investing around €900 million in the new trains and the necessary modifications of the workshop in Grünau. The transport operator has ordered 106 trains with a total of 382 cars from the consortium of Stadler Pankow GmbH and Siemens

AG. Siemens is delivering the key electrical components, such as drive power converters, auxiliary converters, train control system, passenger information system, bogies and brake system. Delivery of the main production series will be completed by 2023.

BOMBARDIER TRANSPORTATION SPAIN

To date, 164 Bombardier FLEXTITY trams have been delivered satisfactorily and on time to the Berliner Verkehrsbetriebe (BVG). Since its entry into service in 2011, the FLEXTITY fleet of BVG has reliably completed 41 million kilometers with 161 vehicles in operation, becoming a key part of Berlin's public transport offer. By the end of this 2018, 12 more trams will be delivered and by the middle of 2020 another 34 will be delivered too. Berlin is the first capital city to turn a complete bus line into an eco-friendly route using e-buses with the wireless BOMBARDIER PRIMOVE charging system. It is an innovative e-mobility solution, based on magnetic induction technology, which provides power to all types of electric vehicles quickly, automatically and without the need to use cables or plugs. Berlin's new fleet of e-buses, which has already exceeded 800,000 km of service,



will save around 260 tons of CO2 per year. In order to achieve the same effect, around

250 private cars in Berlin would have to be switched to electric mode.



At the forefront of Rails Solutions

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



ArcelorMittal's main trending topics for railway:

- **Corporate Social Responsibility:** ArcelorMittal has received the Ecovadis Gold rating.
- **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 centre 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.
- **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 solution related to different applications; LCV (Low Carbon Vanadium) for tramway or new hardness grades for heavy haul applications.

New ArcelorMittal rails calculation tool
Available now for download
in your app store



EVENTS

► 15-18 October 2018
TRADE DELEGATION TO GERMANY
Berlin (Germany)

► 18-21 September 2018
INNOTRANS 2018
Berlin (Germany)

► 6-7 March 2019
2ND FAIR RAIL LIVE!
15TH WORLD METRO & LIGHT RAIL CONGRESS
Bilbao (Spain)

► June 2019
7TH MAFEX INTERNATIONAL RAILWAY
CONVENTION
(Spain)

► 18-25 November 2018
GENERAL ASSEMBLY ALAMYS
Quito (Ecuador)
TRADE DELEGATION
(Colombia)

► 22-24 October 2018
TRADE DELEGATION TO EGYPT
El Cairo (Egypt)

RAILLIVE!



Digital Rail



Urban Mobility



Metro Projects



HSR & Mainline Projects



Signalling & Communications



Operations & Maintenance



Asset Management



Passenger Experience



Revenue Management



Station Innovation



Rail Marketing



Rail Power



Track Infrastructure



Project Management & Construction



Latest Technologies



Ticketing

15th annual
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METRO
& LIGHT RAIL
CONGRESS 2019

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Innovation.
Technology.
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2018

INNOTRANS

THE SPANISH RAILWAYS SECTOR: Proven experience on major infrastructure projects worldwide

MR JOSÉ LUIS ÁBALOS MECO, MINISTER OF PUBLIC WORKS OF SPAIN



In recent decades, Spanish transport infrastructures have been the focus of substantial recapitalisation through sizeable and ongoing investment. The investment efforts made in this type of infrastructures had allowed for the transformation of our entrepreneurial sector, placing to the fore of the world market. Specifically, in the railway sector, Spain stands out in terms of design, civil works, signalling, safe and efficient management of rail traffic, the supply of rolling stock, operations

and maintenance. An example of the foregoing, in High-Speed Rail, Spain has the most extensive European network (with more than 3,000 km of track in service) stressing the value of a highly competitive, majorly professional and wholly integrated industrial fabric, with companies present throughout the entire railways' value chain. Spanish companies in the sector are present in more than ninety countries, offering highly innovative solutions, with the highest standards in

terms of quality and safety, as well as respect for the environment. On one hand, the entry into force of Law 39/2003, on the Railway Sector, incorporating directives from the first and second railway package, contributed to Spain's modernisation of its railway management model on the part of publicly run state companies, entrusted with both the management of the infrastructures, as well as the provision of transport services. Following the entry into force in all of Europe for the 4th Railway Package,

the market will be opened to new operators in 2020. For 2018 the forecast railway investment for carrying out tasks will exceed 4 billion euros (48% of the total volume of investment in infrastructure), which provides a clear example of the weighting this sector has in our country.

Furthermore, European aid programmes must be added, including the recently announced CEF Regulations (Connecting Europe Facility) for the period 2021-2027. In this Regulation, the expansion of the European corridors of the basic transport network is included, amongst which routes in corridors such as the Mediterranean and Atlantic appear, which run through Spain. To complement this Regulation, work is being carried out on the inclusion of some of the connections in the Mediterranean Corridor that have not been included in said Regulation, such as the Valencia-Zaragoza connection which we consider of the utmost importance. Other lines of action that we are going to tackle with regard to the railways would be the improvement of regional rail systems (Radial Nuclei in Barcelona, Girona and Tarragona, Madrid, Cantabria, Asturias, the Community of Valencia and Basque Country, amongst others), the improvements necessary for conventional rail services along the line Madrid-Extremadura and the boosting of rail freight transport with improvement actions aimed at access to ports and terminals.

On the other hand, to adapt to the European directives relating to the release of the railway sector, a modification was made to the Railway Regulations, facilitating the opening



“Spain has a highly competitive, majorly professional and wholly integrated industrial fabric, with companies present throughout the entire railways' value chain”

to competition on passenger transport lines required for 2020.

The Ministry of Public Works develops and will continue to develop a series of actions geared towards providing support for Spanish com-

panies operating abroad. The aims that are pursued are the creation of a technological, innovative and entrepreneurial image of Spain in the sector and taking advantage of the comprehensive capability of the Spanish trade offer, thus bolstering Spanish international positioning.

The infrastructures sector will also undergo an overhaul in the coming years, and with this, opportunities will be presented both for governments, as well as companies in the sector. It is for this reason that from the Ministry of Public Works we wish to facilitate Spanish companies' pro-

“The Ministry of Public Works develops and will continue to develop a series of actions geared towards providing support for Spanish companies operating abroad”

gress, already leaders in the sector, by combining efforts that allow for the further strengthening of its international positioning. Furthermore, the incorporation of innovation in the sector by strengthening investment in knowledge and fostering the development of new sustainable economies, creating economic growth and employment, is another of the fundamental pillars to enhance this development.

Innotrans

For the eighth consecutive year, the Spanish Railways Association, MAFEX, coordinates the Official Spanish Pavilion in the trade fair Innotrans. In this new edition, the increased exposure on a worldwide level of the railway sector will take place in Berlin from the 18th to 21st of September this year and will

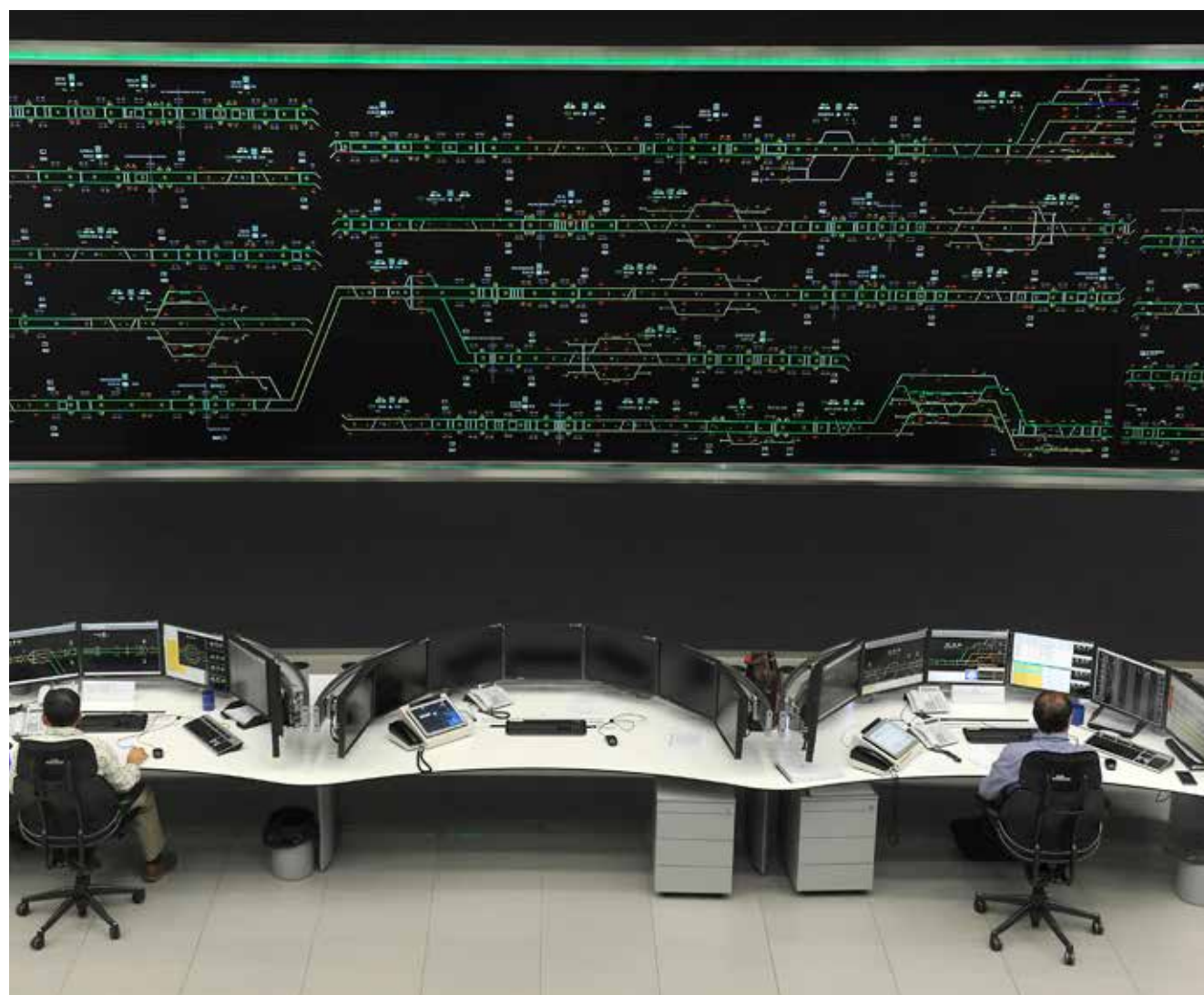
“During Innotrans, Spanish solutions arose the greatest interest due to the advancements on display, as well as its proven track-record in large-scale railway projects the world over”

boast the attendance of more than 55 Spanish firms, alongside Adif and Renfe providing support and offering a showcase for the industry nationwide.

In the 2016 event, 137,391 professionals from 119 different countries took part in an event in which they found out more about the 2,995 exhibitor stands from 60 countries showing innovations in the global

rail offer. Of all of these, the Spanish solutions arose the greatest interest due to the advancements on display, as well as its proven track-record in large-scale railway projects the world over.

This new edition promises to reach record attendance figures, making the same an ideal showcase for Spanish ability in the sphere of the railways.



When the railway Traction travels to the future, it's *i+c*

At Ingeteam, we apply the concept *i+c* to every project we undertake – innovation to find the best solution and commitment to provide the best service.

We strive towards on offering in-house/state-of-the-art developments for **rolling stock** (Traction & Control Systems) and **infrastructure** (Energy Recovery Systems) and we aim to become the preferred technological partner for our customers: cooperation goes from conception and business case to beyond implementation, and our innovation and commitment is shown from project definition, through the study, design and engineering phases to ensure a successful turn-key supply of the complete solution.

The formula of the new energy *i+c*



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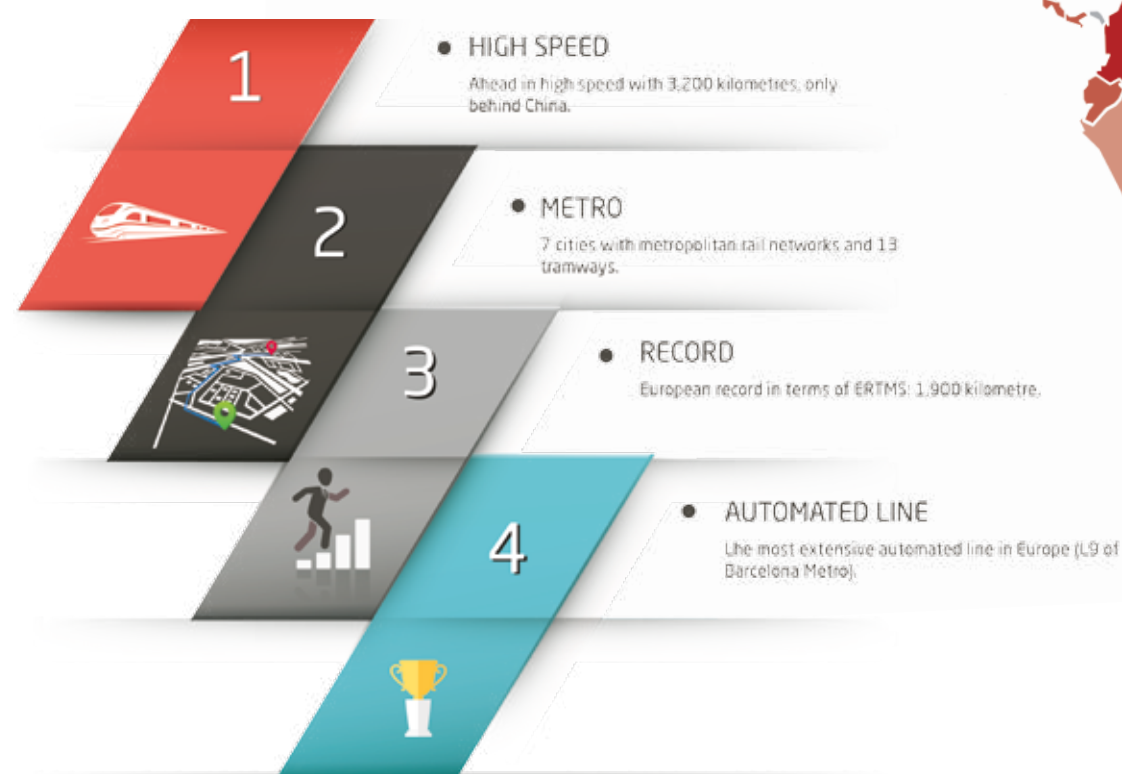
READY FOR YOUR CHALLENGES

The Spanish railway industry conquers the world

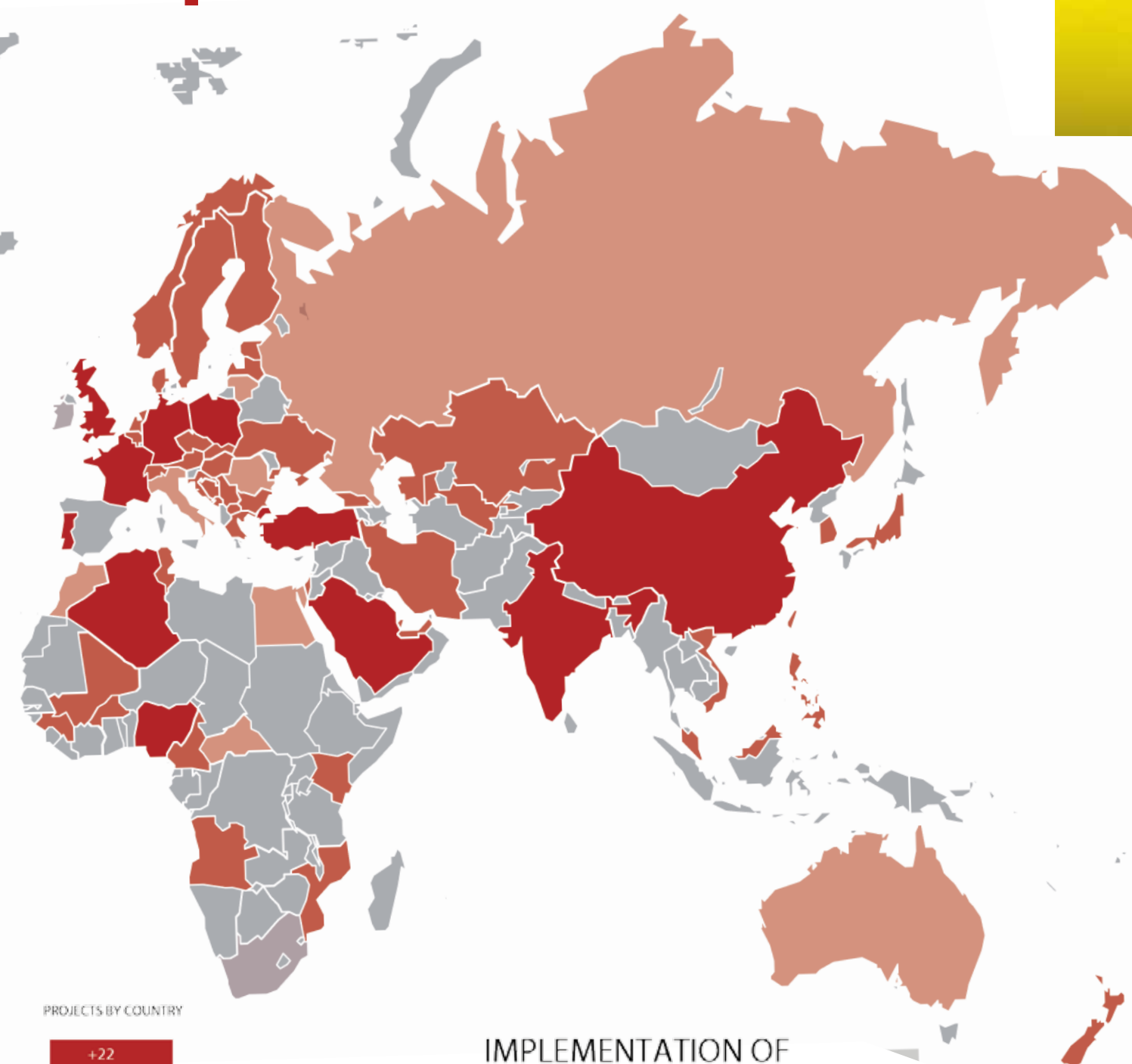
THE EXTENSIVE EXPERIENCE ACQUIRED DURING THE IMPLEMENTATION OF ONE OF THE MOST MODERN AND EXTENSIVE RAIL NETWORKS IN THE WORLD HAS OPENED THE DOORS TO ITS INDUSTRY IN MORE THAN 90 COUNTRIES.

The Spanish rail network is one of the most extensive and modern in the world. It integrates 3,200 high-speed kilometres and metro lines in the main cities: Barcelona, Bilbao, Madrid, Malaga, Palma de Mallorca, Seville and Valencia. These are joined by innovative light rail and tram systems in eleven other capitals (Alicante, Barcelona, Bilbao, Granada, Jaen, Madrid, Murcia, Parla, Seville, Tenerife, Valencia, Vitoria and Zaragoza) as well as a complete national service of medium

and suburban distances. In addition, it has one of the most advanced train fleets in the world, is at the forefront of ERTMS (1,900 kilometres) and has



SPANISH RAILWAY NETWORK, AMONG THE MOST EXTENSIVE AND MODERN



managed to overcome numerous engineering challenges. The construction of these avant-garde systems and their implementation process count on the latest advances in all fields (rolling stock, signalling, telecommunications, tic-

IMPLEMENTATION OF SPANISH COMPANIES IN THE WORLD

North America	30	5
South America	50	2
Europe	63	2
Africa	24	-
Asia	41	5
Oceania	3	-

keting, etc.) and have incorporated into the market their own technological developments.

The industry has developed solid know-how that is now demanded in countries spread over the five continents. Indeed almost 40% of the world's major transport concessions are managed by Spanish firms who already boast a presence in more than 95 countries.

In recent years, the country has become a global technological power, it is a benchmark in the sector and endowed with clear supremacy in the commissioning of new lines and the updating of existing ones.

All this through the work of a highly competitive and professional and widely integrated industrial fabric. Their companies are present throughout the railway value chain, from the planning stage to the commissioning. 🚂



KEY CHARACTERISTICS OF SPANISH RAILWAY COMPANIES

Wide diversity of companies and sub-sectors, use of synergies and adaptation of the offer to the needs of each client or project.

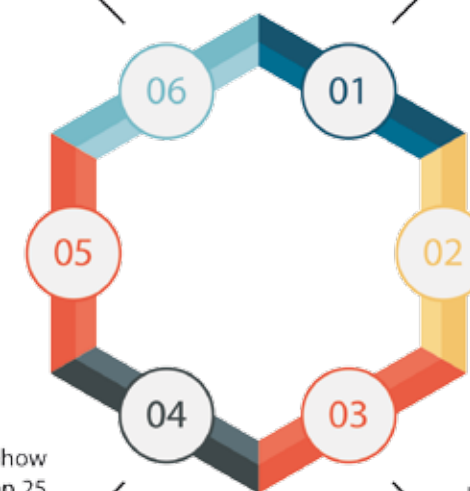
Ability to adapt to different international realities to build and maintain efficient and interoperable infrastructures at competitive prices.

Patented traffic management systems that guarantee greater safety and efficiency.

Presence in the entire railway value chain, from the planning phase to the service start-up.

Consolidated know-how resulting from more than 25 years of high speed rail in Spain.

In-house technological developments exported to the five continents.



Almost 40% of the main transport tenders throughout the world are managed by companies in Spain.

The Spanish industry is present in 95 countries around the world.



Mafex partners, exported in 2017 products with a value of 8.259 billion euros, of which approximately 3.312 billion euros are strictly attributable to their railway activity.

More than 233 delegations and 17 productive implementations spread over 5 continents.

A LEADING INDUSTRY, IN FIVE CONTINENTS

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High speed, technology and know-how that crosses borders

SPAIN INTEGRATES ONE OF THE MOST COMPETITIVE OFFERS IN THE WORLD IN HIGH-SPEED PROJECTS, WHICH ENCOMPASSES THE WHOLE VALUE CHAIN: FROM THE DESIGN, TO THE RUNNING OF THE NETWORK, APPLICATION OF NEW TECHNOLOGIES AND MANUFACTURE OF MODERN ROLLING STOCK. ITS INDUSTRY IS PRESENT IN THE FIVE FLAGSHIP PROJECTS OF RECENT TIMES.

Spain has an advanced high-speed network with more than 3,000 kilometres in service, thus making it the second largest in the world solely after China. This backing over time of high-speed rail has served to place our country at the forefront in this field and export its deep-rooted technical knowledge. Proof of this is the constant visits of foreign delegations with the aim of finding out more about the national rail system and its operation.

It has also successfully exported its own developments, such as the Da-Vinci system for the management of railway traffic, one of the most advanced in the world, which is already operational in Lithuania and Morocco, amongst other countries. Another important stride forward is the advances in automatic width change system of track, of significant interest to countries like Russia; as well as the development of new technologies linked to the mixed



Uzbekistán

Tashkent-Samarkand

The first high-speed train in Central Asia

Talgo has built the units of this network. A project in which the traction division of Ingeteam has collaborated on, herein supplying the equipment in four tractor units of this section, as well as the control electronics.

The Afrosiyob service links Tashkent with Samarkand, in Uzbekistan, using several Talgo 250 units designed to run on Russian track width.



Turkey

Ankara-Istanbul

Three Spanish companies INECO, OHL and CAF participate in the first high-speed line in Turkey: Ankara-Istanbul.



Norway

Follo Line

The largest railway project in Norway, which includes the two longest railway tunnels in Scandinavia.

Spanish companies such as ACCIONA, OHL and Elecnor form part of the project.

Oslo

(Airport Express)

The new high-speed trains for the Oslo-airport line belong to the Oaris family manufactured by CAF.



Spain-France

Madrid-Barcelona-Lyon-Paris

Renfe operates the Madrid-Barcelona-Lyon-Paris corridor together with the French public operator, SNCF, with trains from both companies.



Italy

Rome-Naples

Construction that involved more than 400 km of single track, 50 mobile detours, four stations and the laying of 184 km of track. More than 13% of the route takes place through a tunnel.

The Spanish company COMSA was responsible for these works.

Milan-Naples

First experiment in the world with injections to consolidate the earth compensating with guided drilling along a curved line.

Spanish companies such as ACCIONA are involved in this project.



United Kingdom

HS2

The Spanish industry is present 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)

Participating companies: Ferrovial, Ineco and Sener.



Saudi Arabia

Mecca-Medina

This is the most important tender awarded to Spanish companies, for a value of around 6,500 million euros.

Companies: Adif, Renfe and Ineco, and private OHL, Indra, Cobra (ACS), Consultrans, Copasa, Imathia, Dimetronic, Inabensa and Talgo. All these firms account for 88% of the winning consortium, which is completed by two local firms, Al Shoula and Al Rosan.



United States

High-Speed California

The United States relies on Spanish companies for high speed in California, one of the most ambitious infrastructure projects in the country.

ACS and Ferrovial are involved in these works.

DID YOU KNOW THESE FACTS?



Spain is a leader in the implementation and development of this European interoperability system, whose installation covers a length of about 1,900 kilometres of its network.



Adif has developed a fully Spanish catenary under the name C-350.



The eight major high-speed projects of recent times in the world bear a Spanish stamp.



Infrastructure manager Adif has received, in the last four years alone, 375 visits from different foreign delegations with the aim of finding out more about the national rail system and its operation.



The Spanish industry has introduced in the world market two platforms of high speed of last generation: Oaris and Avril.



Spanish high-speed technology is successfully implemented in all markets: Saudi Arabia, Great Britain, Turkey, United States; Egypt or India, amongst others.

Spain comprises one of the most competitive offers in the world in terms of High-Speed rail projects.

width or "third lane", the creation of an entirely Spanish catenary under the name C-350, or the high-speed platforms AVRIL manufactured by Talgo and Oaris by CAF, which are renowned amongst the most advanced throughout the world. This experience has enabled the Spanish industry to take its place at the fore of the most important high-speed initiatives of the moment such as the project Mecca-Medina, one

of the most important infrastructure projects in the Arab world in recent decades; the Berlin-Moscow railway corridor, which runs on two different track widths; the first high-speed network in California, which is also the most ambitious infrastructure programme in the US, the high speed line between Ankara and Istanbul and the Marmaray Tunnel, built under the Bosphorus, amongst numerous other examples.

Urban rail transport: Networks bearing the Spanish hallmark

SPAIN APPEARS AS ONE OF THE MAIN SUPPLIERS OF STATE-OF-THE-ART SUBURBAN AND LIGHT RAIL NETWORKS.

The implementation of this extensive diversity of urban systems has led to an extremely high degree of excellence. The combination of cutting-edge technology from Spanish infrastructure companies means that the country also appears as one of the

main suppliers in state-of-the-art suburban and light-rail projects. Examples of this are important projects and works of extraordinary technical complexity, such as the Riyadh or Stockholm Metropolitan Railways, which include a deep tunnel in rock under the sea. 🚇



SUCCESSFUL PROJECTS OVER THE FIVE CONTINENTS



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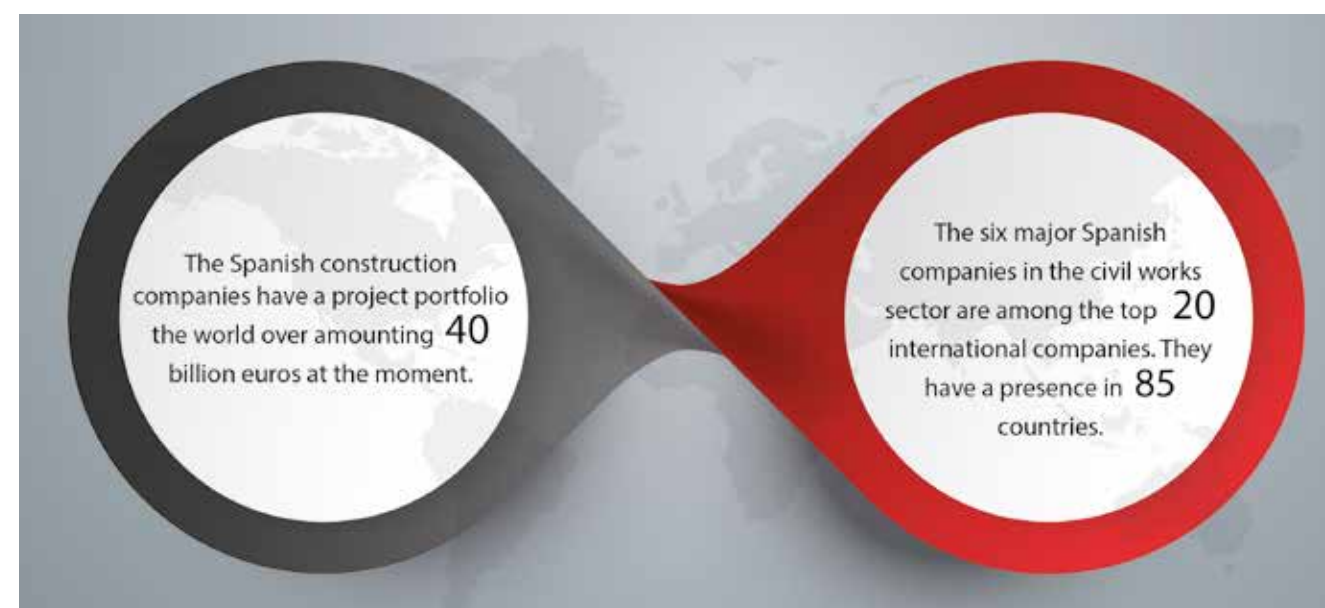
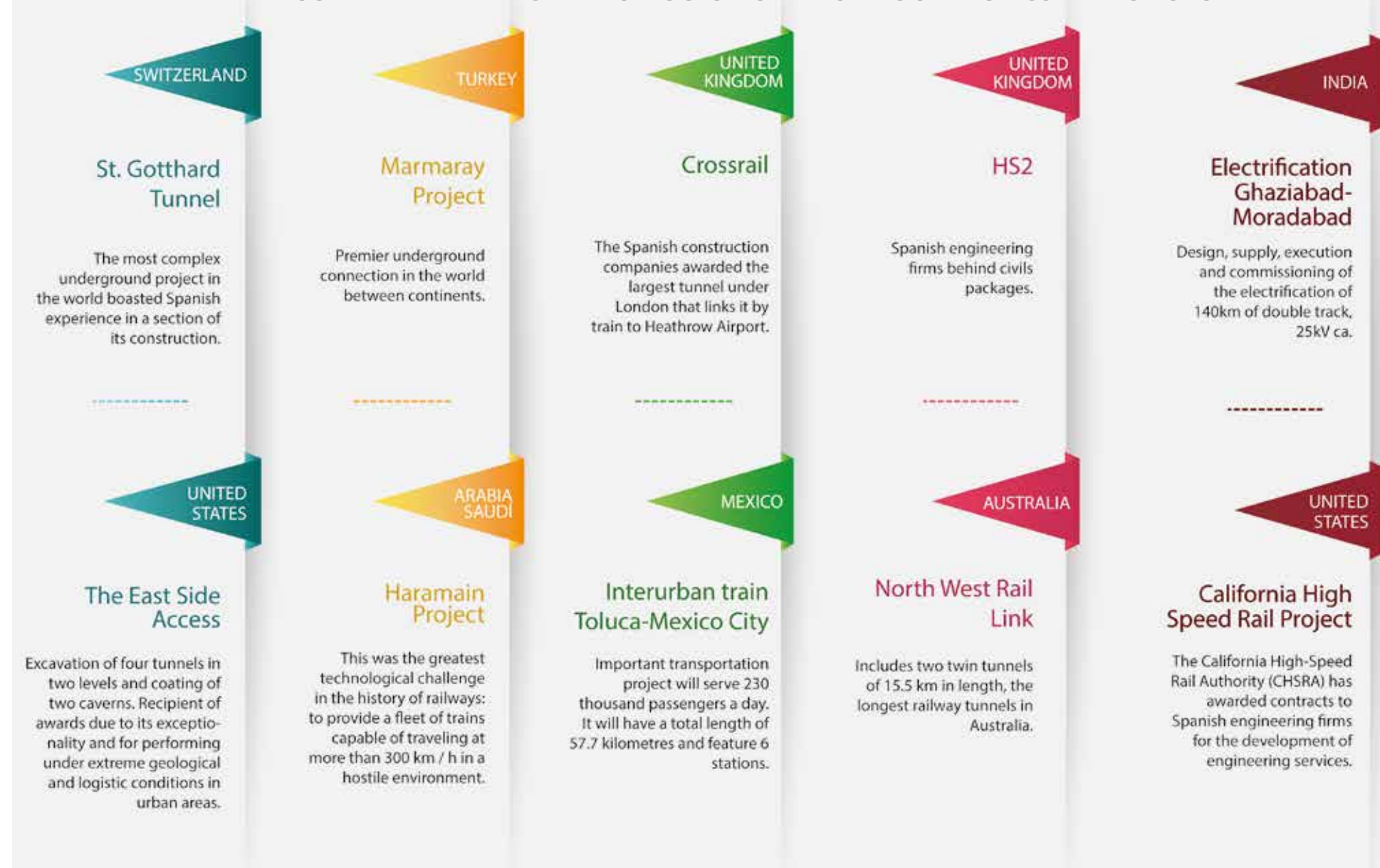
Infrastructures: technical experience that overcomes major challenges

THE SOLID PROFESSIONAL KNOWLEDGE ACQUIRED BY THE SPANISH SECTOR CAN BE SEEN IN ITS INTERNATIONAL RENOWN.

The ability to build and maintain interoperable infrastructures, provide traffic management systems with maximum guarantees in safety and efficiency, at very competitive prices, means that Spanish industry has an increasingly significant weighting. Its leadership is evident, for example, in the major metropolitan railway works of recent times (Riyadh, Doha, Lima, Panama). Also, rolling stock has been developed with state-of-the-art trains, with modular and flexible designs that are adapted to the specific needs of each network and operator. All this is joined by the significant contributions in terms of energy efficiency as energy recovery systems,

which have made catenary-free rail traffic possible, or train-tram systems, specially designed to link urban centres and nearby towns with units that also take advantage of the commuter networks. Figures published also indicate its outstanding position. 35% of metropolitan railway networks in South America and 25% of European networks feature Spanish technology. All these milestones have made the railway administrators request the support of Spanish companies as top-level consultants and technical advisors to successfully meet the new challenges presented by providing the best and most modern solutions. 🚂

SOME EMBLEMATIC INFRASTRUCTURES FEATURING SPANISH CONTRIBUTIONS



Spanish companies are at the fore with regard to design and construction of major railway tunnels.

The San Gotardo, located in the Swiss Alps, is the longest (57 km) and deepest in the world.



Spanish industry, top of the tree for technological railway achievements

Spanish companies have become a favoured railway partner due to their multiple qualities. Their extensive technical knowledge, the highly qualified nature of their experts, as well as the working synergy of the multi-disciplinary teams, are present in the planning, design and implementation of numerous transport systems. These achievements have been possible thanks to the major investments in R & D. State-of-the-art technology results in significant and constant progress in terms of environmental management, interoperability, system automation, accessibility, user comfort and safety. The numerous developments that this industry has incorporated into international projects has allowed for many countries to boast cutting edge railway networks.

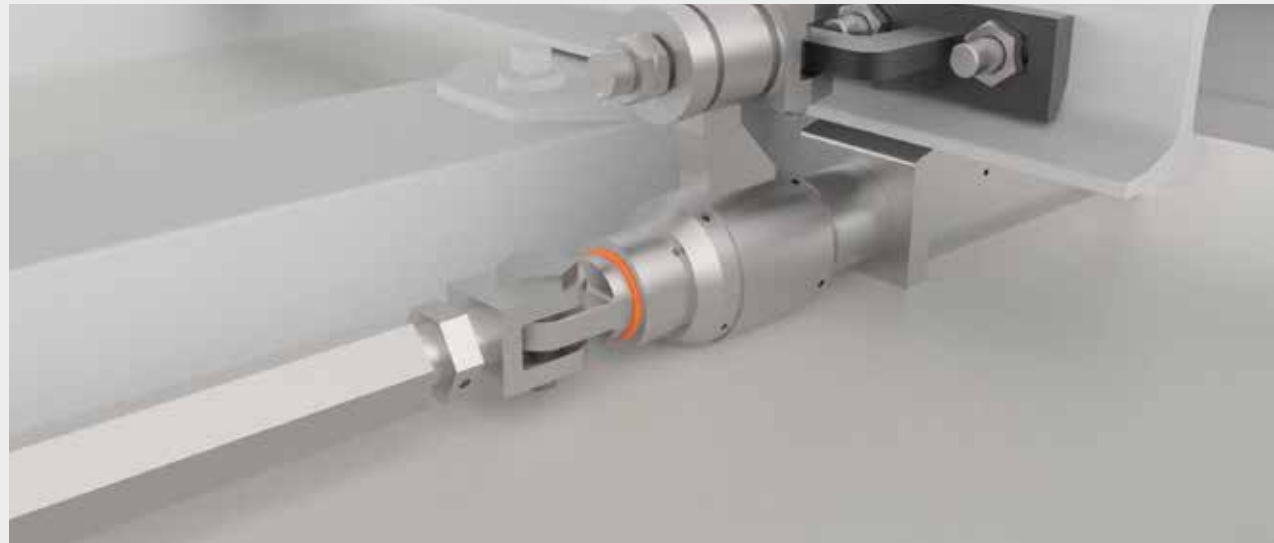


Some Spanish technological developments regarding high speed rail

TECHNOLOGY	DESCRIPTION
DaVinci system	Global reference platform for the management of high-speed rail traffic and other networks. Implemented in Morocco, Lithuania,
Ferrolinera®	Improves the energy efficiency of the railway sector by recovering braking energy from trains for the recharging of electric cars.
Aerotravesía	New design of sleeper for high speed that minimises the effects of the phenomenon called "ballast lift".
Railway Technologies Centre	With the creation of the CTF, the position of the Spanish railway system is reinforced as a benchmark for the European and global technological vanguard.
New generation of AV4 detours	Developed in Joint Venture with Fabridis in line with ADIF requirements.
"Telphe" Technology	Created by Telice, it prevents road needles from freezing due to the cold.
Solutions for gauge width change	CAF and Talgo. Innovations that allow rail vehicles to adapt to any track width.
Very high speed train AVRIL (Talgo)	Integration of significant advantages in the field of energy efficiency and the use of advanced materials. Reaching 380 kilometres per hour as a maximum travelling speed.
Oaris high speed platform (CAF)	Advanced concept of high-speed train that responds to the challenge of railway interoperability.
New train-tram transport solutions:	Units provide service on tram lines in the city and connect with other urban centres taking advantage of the local infrastructure.
Diesel Locomotives	Development of first passenger diesel locomotives operating at 200 km / hour worldwide. Versatile bi-mode locomotives: the technological response to the challenges posed by cross-border corridors.



NEW PRODUCTS AND TECHNOLOGIES
MAFEX’S PARTNERS DISPLAY THEIR INNOVATIONS AT INNOTRANS



Amurrio innovates in the components of its railway turnouts

AMURRIO

A roller locking device that hardly requires maintenance throughout its life cycle. This is CRBM, the roller locking device with watertight mechanism developed entirely in Amurrio. Sealed against water or dirt, CRBM

internal parts roll or slide on antifriction materials, reducing the need for lubrication. It can be installed by only one person, and does not require holes in the rail. It is adaptable to all track widths and blocks both the tongue attached as the open.

A fixation designed specifically for use in turnouts, which significantly facilitates installation and reduces

costs. These are the innovations of Amurrio Ferrocarril y Equipos, one of the international leaders in the manufacture of manganese steel crossings (Mn12 / 14%) and in the manufacture, installation and maintenance of turnouts for high speed, conventional, metro, tram and heavy haul railway paths all over the world.

New rails calculation tool
Available now for download
in your app store

rails.arcelormittal.com



ArcelorMittal is extending its 4.0 transformation with several digital tools

ARCELMITTAL

ArcelorMittal Rails & Special Sections launched the Rail Tool App in continuation of the permanent evolution in the rail sector.

Available now in stores, allows rail key players to:

- get interactive information regarding

standards and profiles for different rail product typology.

- calculate length or tonnage for different types of railway projects.

- download the dimensional profile drawing for transport, crane, light and tram applications.

Website rails.arcelormittal.com, was revamped to make it more products-oriented, more responsive and to offer an improved visitor experience.

Available in English, Spanish and Polish, is now enriched with three new landing pages in French, Portuguese and German.

Also, an interactive and three-dimensional tour was added; it features a realistic digital walkthrough of ArcelorMittal's rail facilities, the R&D Centre and the port, that can even be visualised in 3D using cardboard glasses.



Variable gauge OGI Axles for freight

AZVI

In order to solve the problem of breaks of gauge between the different railway networks in rail freight, the consortium composed by Azvi, Tria and Ogi, as well as Adif, has de-

veloped an automatic variable gauge system made up of variable gauge axles and a gauge changeover facility.

The Variable-gauge Axle homologation process set out by the Spanish ETH standard is being verified and certificated by Bureau Veritas, the en-

tity responsible for publishing the evaluation report.

Currently, the OGI axles have successfully completed Laboratory Tests and On-Track Tests, as well as the 100,000 km in Phase I and II of the In-Service Tests set out in the standard, and they will obtain the provisional Technical Approval for commercial operation.

VISITANOS EN
HALL 22 / STAND 704

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Leadmind, caf digital train

CAF

CAF LeadMind Platform provides a new generation of connected trains and more competitive services to operators and maintainers of the railway industry through the collection, storage, processing and advanced analytics to support real time decision making and advance towards condition based / predictive maintenance.

LeadMind:

1. Provides a modular, open and scalable product, customizable according to client's needs.
2. Delivers insights in a friendly format and a powerful tool to ease the decision making process.
3. Increase efficiency in operation and maintenance (reducing LCC, improving fleet availability and root cause analysis, reduction of repeated failures...)
4. Eliminates black-boxes by mixing all the data of the railway ecosystem.
5. Complies with modern Cybersecurity standards.



Projects:

Amsterdam Trams, Flytoget, Brussels Metro, Northern Arriva, Transpennine Express, NS, Metro Chile, Euskotren, SAR, Trenitalia Locos...

CAF Signalling shows in Innotrans next generation developments regarding signalling

CAF SIGNALLING

Concerning the European Rail Traffic Management System (ERTMS), the company has the comprehensive solution Auriga: ERTMS Level 1 and Level 2. In this edition the ATO (Automatic Train Operation)

solution will be reported with a degree of automation GoA2 based in specifications of ERTMS interoperability. The system is divided in two parts, track ATO, for the automatic regulation of the traffic; and boarded ATO, It includes improvements in performance, expenses and user experience. In the fair it will be disclosed the product and service family of CAF

Signalling. Among them, the electronic interlocking QUASAR S3e and the solution NAOS for Integrated Control and Multifunctional Centres, along with the most recent development underway for the interoperable CBTC, resulting from the agreement between ETS and Euskotren. The solution will be installed at the end of 2019 on L3 of the Bilbao Metropolitan Railway.



Ceit-IK4 presents MainRail: solutions for the management of infrastructure maintenance

CEIT-IK4

MainRail (www.mainrailsolutions.com) is a tool that allows optimizing the costs associated to the management of the railway infrastructure maintenance. It is a modular solution that adapts its functionality to the operator's needs. MainRail is composed by five modules that are fully customizable:

- ASSETS, for the digitization of assets (discrete and lineal) to be maintained
- HEALTH, that integrates the data coming from auscultation devices and other means of inspection, in order to monitor the health status of assets.
- MAINTENANCE, for the management of maintenance operations.



- PREDICT allows evaluating future scenarios based on accurate predictions to assist in the decision making.

- DASHBOARD, with information about the business-relevant indicators for the strategic management of maintenance operations.

SOLUTIONS FOR WASH PLANTS AND WATER TREATMENT FOR RAIL DEPOT

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Hall 7.2C / Stand 201

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CETEST technology applied to instrumented wheelsets

CETEST

The wheel-rail contact plays a key role in the vehicle dynamics from the point of view of rolling safety, ride quality, track fatigue, safety

against derailment or wheel and rail wear.

Instrumented wheelsets are designed to measure the wheel-rail contact forces. CETEST offers, as a product or test service, its own patented strategy for strain-gauge

based measuring wheelset solution, specially designed to minimize the effects of different sources of uncertainty.

The calibration process appears crucial to assess the accuracy of this measurement system. CETEST decided to develop its own roller test bench for instrumented wheelsets, which allows the independent application of turn, vertical and lateral loads in both wheels.

CETEST instrumented wheelsets have been proven under special environmental conditions, such as ice, sand and extreme temperatures, as well as at high speeds. Tried and tested in all market segments (me-

tros, locomotives, high speed trains, special maintenance vehicles, freight wagons, active tilting technologies, variable gauge, etc.) and across the entire globe.

More than 70 wheelsets have been delivered in the last two years!



DANOBAT has developed a Technology for Smart Wheel Reprofilng

DANOBAT

The company will present its technological development for in-

telligent wheel machining at the upcoming INNOTRANS fair.

The technology developed by DANOBAT reduces cycle time, increases the process reliability and safety and extends the life of the

wheels within railway fleets. The stand will also be dedicated to explain DANOBAT's comprehensive solutions to all manufacturing processes of rolling stock parts. In addition, the company will avail of this opportunity to share its digital value proposition composed of in-house, technological developments

COMSA brings its centenary railway specialization to InnoTrans

COMSA

COMSA will show at InnoTrans its turnkey services offer of construction, industrial engineering and maintenance for high-speed and conventional lines, metros and tramways.

With over 125 years of railway specialization, the company will expose success cases such as its participation in all Spanish high-speed projects, the expansion of the lines 2 and 3 of the Ankara metro (Turkey) and the A, B and C lines of the Dublin tramway (Ireland).



Construction of the railway line between Gradec and Sveti Ivan Zabno (Croatia).

Geminis GR3-W will be presented to the professional public for the first time at InnoTrans 2018

GORATU

Geminis is going to present a wheel hub boring machine at the booth 701 of Hall 22A at the InnoTrans. It is going to be the first time that the vertical machine for boring applications is going to be showed at a fair.

The GB3-W integrates the last available technologies and some of its most important features are: hub boring application specific design, easy to use interface, automatic tool change, wheel hub



measuring system integration, automatic reports generation, hydraulic autocentering chuck.

Geminis machines are specialized in machining of axles, wheelset and wheels. Geminis has a track of more than 60 years supplying highly demanding machining solutions and service all over the world.

One of our more important characteristic is the customizing capacity of our solutions. This has been highly considered in the GR3-W design to fulfill all customer needs.

Geminis - InnoTrans
Hall 22A- Booth 701

Geminis is the brand of the manufacturer Goratu.



ICON Multimedia goes to InnoTrans with DENEVA, its intelligent solution at the service of citizen

ICON MULTIMEDIA

With the aim of offering a higher quality of service, security and bet-

ter information for the citizen, DENEVA PIS becomes into a Comprehensive Communication System designed, not only for the travelers needs, but also in users as potential service customers, around stations or airports.

companies, reducing the costs of public infrastructures, and improving the return on investment obtained.

ICON Multimedia will be in InnoTrans at Hall 22/Booth 704

ICON Multimedia incorporates its intelligent technology in Digital Signage to keep the passenger's attention more effectively. Its updated DENEVA Digital Signage solution for transport includes wayfinding systems, measurement of audiences that allow to realize specific advertising campaigns, or even more, to take the emotional control of travelers. DENEVA software also allows the use of these systems by third-party

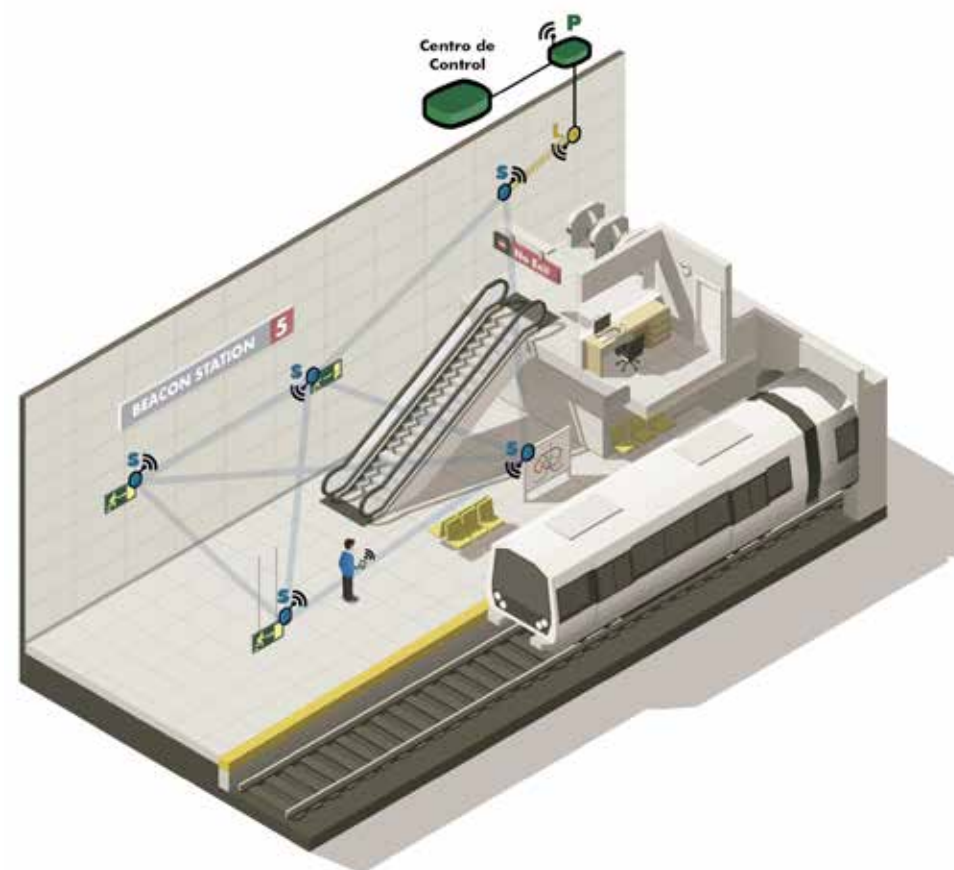
High security thanks to beacon technology

IMPLASER

Implaser has developed an intelligent security systems with beacom technology that we will present at InnoTrans 2018 in Hall 22 / 704.

The beacons are part of the sign. Through an App that works as an interface between the beacons and the user, new and interesting features like the following can be managed:

- Guide the user. The user is given information of interest about a determined place or about the environment in general.
- To promote an accessible environment. It can provide information to visual or hearing-impaired people to ease their guiding in normal conditions and also in case of emergency.
- Guide in case of emergency. It enables a safer evacuation with the usual signalling. In determined situations, the closer emergency exit could not be the safest.



- To verify the route. It is useful for verifying the correct compliance

of the surveillance tour or maintenance routines.



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STADLER



Indra promotes the rail interoperability and digitization

INDRA

Indra is presenting its leading solutions for operation management, safety and collection, which incorporate the latest digital technology and the company's innovations. Its ERTMS technology is more inter-

operable, with an RBC system "Open ERTMS" that offers open and standardized interfaces for the control center's signaling and management systems and EVC onboard solutions, which expand their functionality and compatibility with infrastructure systems.

Indra brings the latest generation of smart and secure IoT to the sector

with innovative wireless communication-based solutions and develops a new interoperability framework to make it possible to book a trip in different means of transport in Europe in a single click.

It is presenting too its ticketing systems and its TMS, considered the most advanced rail traffic management platform in the world.

INGEteam : Bigger presence at INNOTRANS

INGEteam

The company will show new power basic electronic modules for INGE-

TRAC converters and INGESYS solution.

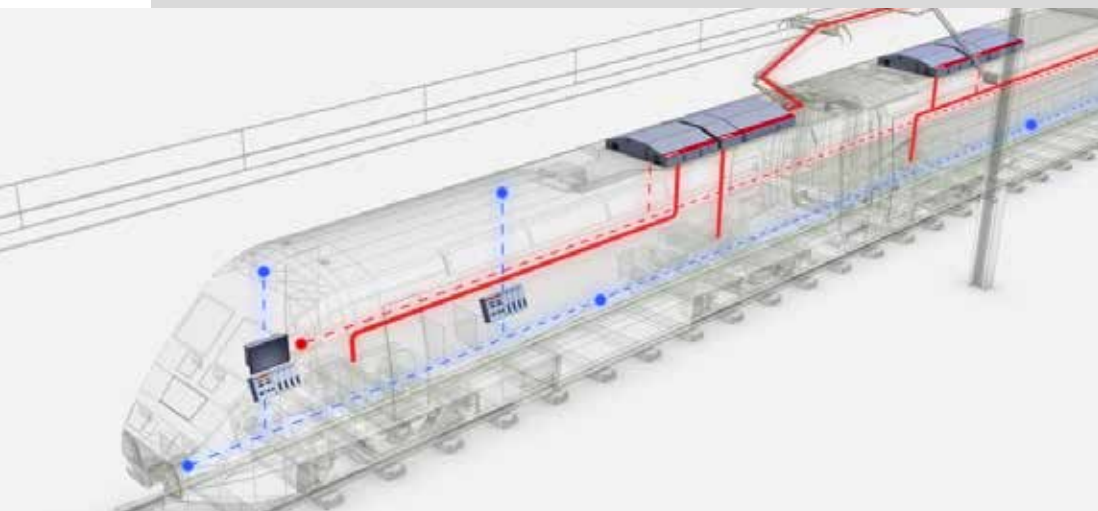
INGEteam will present the High/ Medium / Low power electronic modules for INGETRAC converters

for all kind of rail vehicles.

The new modules are designed with most advanced topologies and are being implemented on the latest rail projects.

We will also present latest energy recovery projects.

On hall 6.2 , INGEteam will present INGESYS control and monitoring solution responds both to the automation needs of the train (VCU, RIO, MU, TWC, etc.) and its auxiliary systems (HVAC, WC, doors, etc.), through a modular architecture that can be configured to the needs of each application.



New tool for galley management: GMS

KELOX

Kelox presents at Innotrans 2018 the GMS automatized solution. The galley is a food service area where the crew prepares, heats, and cools meals for passengers. The electrical cabinet is composed of:

- Electrical and communications interfaces
- Electrical protection systems
- Galley Management System (GMS)

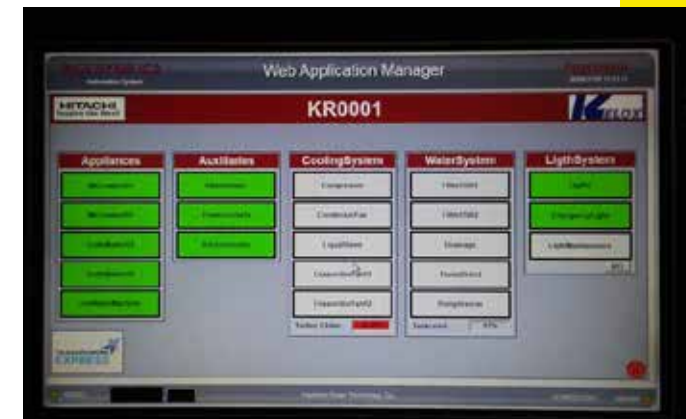
The main function of GMS is to monitor, control, and perform data storage of all galley functional modules or subsystems.

The GMS is an automatized solution based on a central unit with local I/O and a remote CAN with I/O distributed. The control can be integrated in the train Ethernet network in order to provide maintenance task information. Each user has a customizable profile controlling access and system permissions for the PLC, from locals HMI (touch screen) and

from PC through the web server embedded in the GMS.

The GMS is a Satys designed solution for functional or subsystems modules of the galley/ restaurant areas within the train. Its main features are:

- Comply with Rolling stock standards EN50155 y EN45545-2
- Uses communication buses such as: RS232/485, CAN, MVB, Profibus, Ethernet TCP/IP, TRDP, Ethernet IP, CIP and IPTCOM
- Internal structure is modular configuration with I/O signals and interfaces. It allows many different applications
- Multiple I/O modules (digital/analog, output relay, motor control, audio messages, etc.)
- Software compatible with standard IEC61131 and program with C/C++
- Web server embedded for remote diagnostics and monitoring



The GMS advantages are:

Improvements in Predictive Maintenance, RAMS & LCC:

- Status and Performance of all systems and subsystems
- Failure Modes (normal, degraded, emergency)
- Individual system and subsystem operating duration and number of cycles
- Pressure and temperature of the cooling circuit
- Tank level status for oil, gas, and water.

The innovative proposals by NEM Solutions, at Innotrans

NEM SOLUTIONS

NEM Solutions offers data analysis solutions for the generation of normal machine behavioral diagnostics. In the current Innotrans edition, opt for translating knowledge obtained from raw data into services

With the purpose of implementing predictive maintenance strategies closely linked to technological change, through our A.U. R. A platform NEM Solutions offers its in-depth knowledge of data analysis, as well as its dominant position in the Railway sector. With a customer accompanied service in order to extend the life cycle of train assets, in this way they manage to both improve availability conditions and reduce costs. Definitely, NEM Solutions proposal for creating added value revolves around a customer-focused approach along with the successful implementation of technology facilitates the optimization of maintenance plans.



JEZ presents turnouts and diamond crossings for urban transport vehicles

JEZ

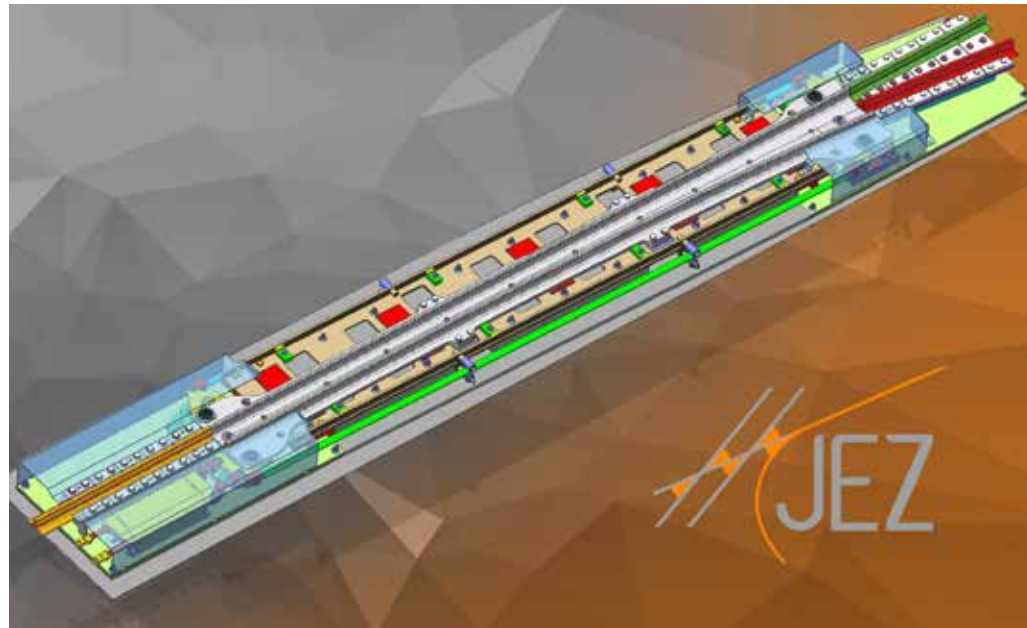
In the last decade, urban transport vehicles have been introduced in Europe with hybrid characteristics between a tram and a bus.

The system consists in vehicles with pneumatic wheels guided through a central rail, and a metallic wheel system that clamp it.

These central guidance systems need track devices, such as turnouts and diamond crossings. JEZ has developed turnouts and diamond crossings for this type of transport systems, integrating in them the switching engine, the

position detection and the heating. The solution developed by JEZ consists of rotary panel with main and branch rail, preferably made of Mn steel, Cam mechanisms at the entrance and exit of switches, with

integrated locking system of the end positions and integration of the switching unit, locking and detection of the electrohydraulic engine UNISTAR HR inside the turnout or the diamond crossing.



Segula Technologies will present its specialized offer of Augmented Reality at Innotrans

SEGULA TECHNOLOGIES

On September 18th, Segula Technologies will attend to the Innotrans

event in Hall A. - Stand 403. It is the largest European event in the railway sector, where the French group will present the full range of services, with a special emphasis on Augmented Reality. Currently in the group, the AR is being used in nu-

merous projects for the preview of technical and useful information in design, training, production, use, maintenance and distribution with some of our customers.

The objective is to drastically reduce the time in the productive cycle phases and to benefit from the errors reductions, the greater labor security and foresight. The adoption of methods such as those developed by Segula is part of the digital transformation of the corporate and productive environments of the connected industry.

Segula Technologies, has successfully implemented RA projects in the aeronautical, automotive and energy sectors, and the railroad is the next to be developed.

With this technology, Segula will be able to provide a unique and differential value to the client portfolio, making again a further difference in the sector.



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High-Speed
Railway


Stations


Railways and
Freight Terminals

Workshops and
Depots

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The new generation of Stadler's locomotives. EURODUAL – the universal locomotive

STADLER RAIL VALENCIA

Berlin is always worth a visit. At InnoTrans 2018 Stadler launches 7 innovative vehicles among which includes the new generation of 6-axle locomotives designed and manufactured by Stadler Valencia. The exhibited locomotive will be the EURODUAL for the German operator HVLE that has acquired 10 locomotives of this type. The versatile 6-axle bi-mode EURODUAL locomotive can run on electrified lines with a power of up to 7 MW but also has a 2,800 kW diesel engine to operate on non-electrified lines.

It offers two solutions in one and combines the advantages of both types of traction, diesel and electric. In addition, its incredible performance, efficiency and hauling capability allows to transport longer and heavier trains with a single machine. The EURODUAL is the technological response of Stadler to the challenges

posed by cross-border corridors such as the Mediterranean or the Atlantic Corridors. With its avant-garde technology, it covers every need in an efficient and reliable way

o f f e -

ring rail operators numerous economic and ecological benefits.



Customer	HVLE
Region	Germany
Number of vehicles	10
Locomotive type	Dual-mode: Electric/Diesel-electric
Track gauge	1435 mm
Axle arrangement	Co'Co'
Supply voltage	25 kV 50 Hz and 15 kV 16.7 Hz
Diesel engine	CAT C175-16, IIIB
Power	Diesel: 2800 kW Electric: Up to 7000 kW
Starting tractive effort	500 kN
Fuel tank	3,500 l fuel
Urea tank	400 l
Transmission	AC/AC
Maximum speed	120 km/h

Modular vehicle platform meets growing demands for flexibility, lower lifecycle costs and improved comfort

SIEMENS

The new Velaro Novo from Siemens is a systematic further development

of the three preceding generations of Velaros. Numerous innovations in details make the new high-speed train a unique, highly efficient concept that consumes 30 percent less energy and substantially reduces investment and maintenance costs while at the same time providing

a ten-percent increase in capacity. With its empty tube concept and numerous configuration possibilities, the Velaro Novo is future-proof and can be flexibly adapted to meet new design concepts and operator needs even after years in operation.



NANOTEC signs, cutting-edge signalling

TECNIVAL

Tecnival is the leading company to manufacturer Fixed Signalling (Marker Boards). During 2017, the R+D Tecnival have developed the Nanotec Signs, the first signs in the world made with composite additive with graphene, complying with the European Standard EN 12899-1 and obtaining the CE MARKING.

We can highlight the main advantages of Nanotec Signs; presented at Innotrans:

- Light, Elastic and Safe.
- Corrosion-free. Excellent behavior against the humidity.
- Low environmental impact.
- Resistant to loads; snow & wind.
- Low residual value.
- Low maintenance and transport cost. Improving work team time.



New system for in-service ultrasound inspection of railway axles

TECNATOM

Within its line of railway products, Tecnatom has developed a

new portable system for in-service maintenance of solid axles, named "SAIS" (Solid Axle Inspection System), which allows the ultrasonic inspection of the entire axle in a simple and reliable way. SAIS uses

a phased array probe that performs an angular sweep and an encoder that synchronizes acquisition with rotation, thus ensuring optimum coverage and detection.

The evaluation of defects is performed automatically, identifying geometric echoes to avoid false positives.

The inspection results are digitally signed and fully stored to ensure the traceability and auditability of the process.

The equipment works on batteries and incorporates a tablet, from which the inspector carries out their work. The system has WiFi connectivity for connection to the workshop's computer network or to the Internet.



Teltronic, secure radio communications that enhance rail operations

TELTRONIC

Teltronic, backed by over 40 years of experience deploying the safest professional mobile radio (PMR) projects worldwide on a turnkey basis, Teltronic presents at Innotrans a broad portfolio of critical communication solutions for transportation.

Based on TETRA and LTE technologies, Teltronic develops customized and fully integrated projects of metros, tramways or railways, with solutions comprised of infrastructure, on-board radios and command & control, and provides integration with a variety of applications used in the daily running of a transport service, such as passenger information systems, signalling data, real-time surveillance or internet for passengers.

A strategic point to highlight from the Teltronic portfolio at Innotrans



is the professional broadband LTE technology.

Developed according the 3GPP standard, it provides data capabilities to signalling CBTC appli-

cations among others, including a comprehensive list of advanced features as high availability, QoS mechanisms or priority management.



Thales at Innotrans

THALES SPAIN

Thales will be present at Innotrans 2018 with a wide range of products and Solutions for main and High Speed lines as well as urban transport.

SelTrac Generation 7: The new age of CBTC, the enabling platform for autonomy.

Cybersecurity: The entire portfolio of solutions and services for cyber transport.

Aramis: New Generation cloud based ready for digital Traffic Management System (TMS) for integrated Network and Centralised Traffic Control (CTC) centres.

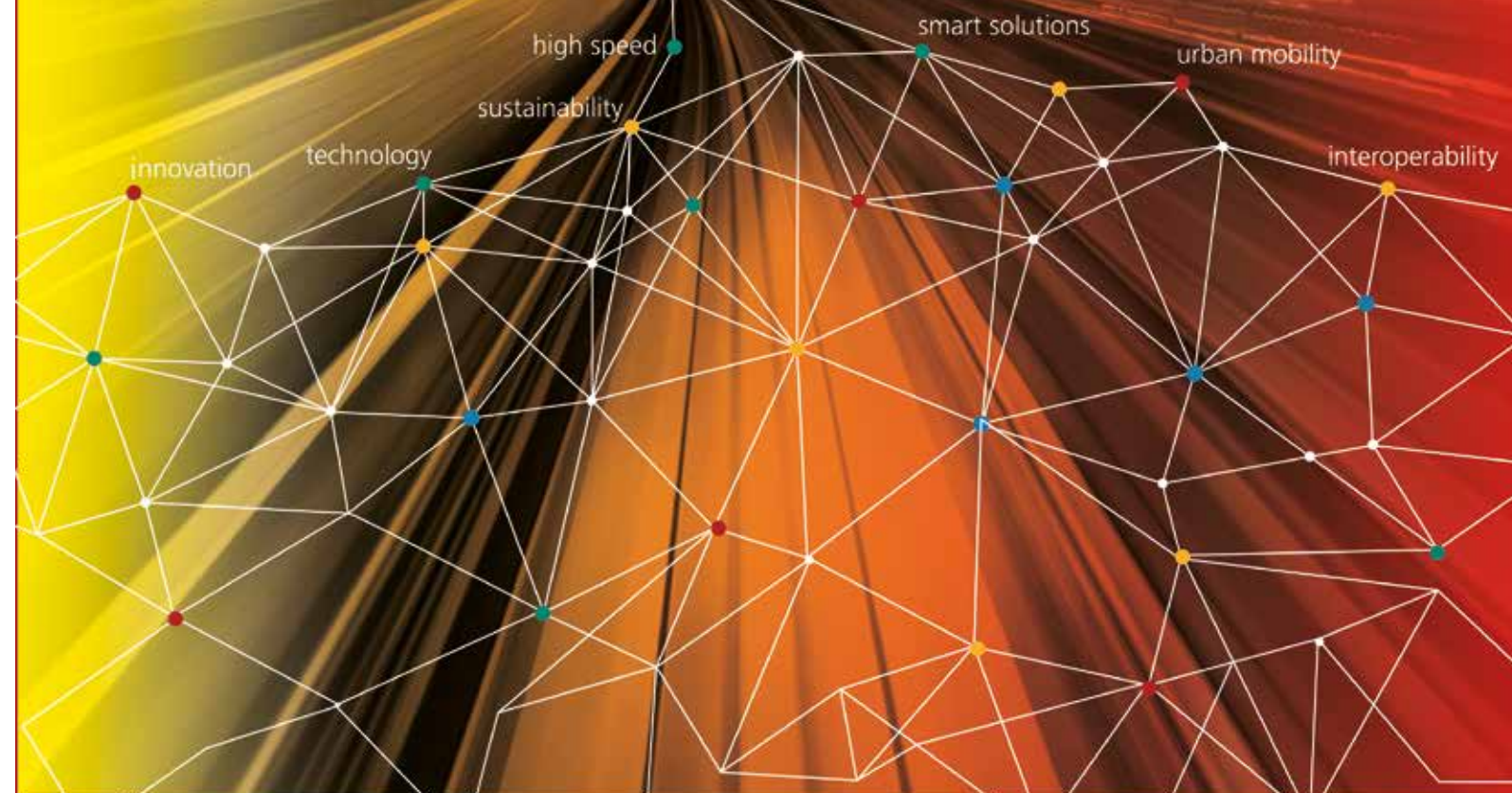
FICOS: the Fiber Optics Axle Counter, a breakthrough in rail field elements.

Digital services platform: NAIA, Eclipse, VCA as services on the platform.

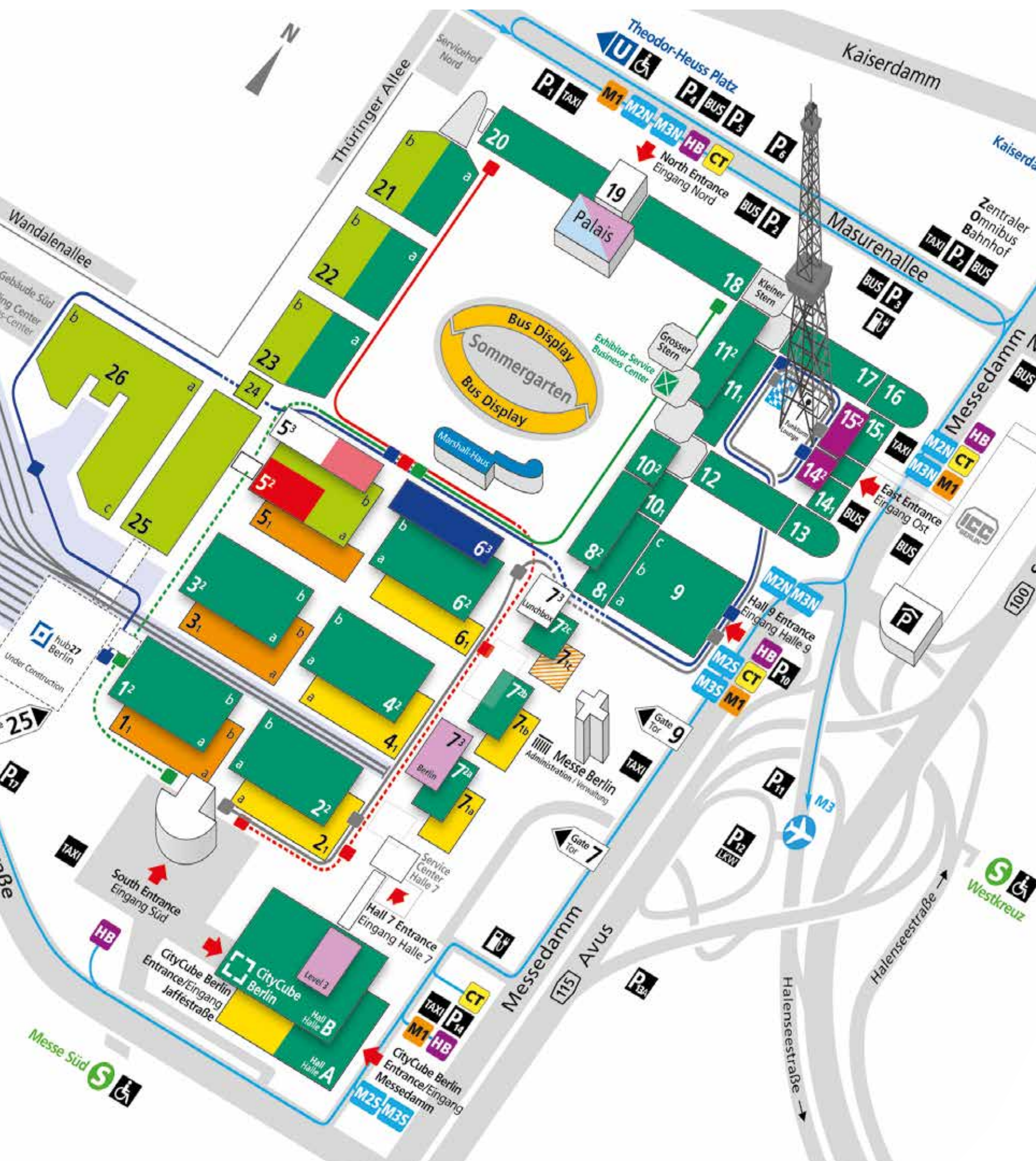
You can have the opportunity to immerse yourself in our journeys through our interactive digital walls and discover our Vision Lab where we will have different topics:

- Autonomy
- Smart infrastructure and IoT
- Data-driven operations
- Interactive screen to showcase Thales innovation solutions for transport

2018



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SPANISH PARTICIPATION AT INNOTRANS

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- Railway Infrastructure
- Tunnel Construction
- Public Transport
- Outdoor Display Gleis- und Freigelände
- Bus Display
- Opening Ceremony Eröffnungsveranstaltung
- InnoTrans Convention
- Speakers' Corner
- Career & Education Hall incl. Career Forum
- Business Lounge (Marshall-Haus)
- Press Center Pressezentrum
- Restaurant „Meet'n'Eat“
- Restaurant „Oktoberfestzelt“

- Shuttle Lines - Shuttle Linien
- Olympischer Platz P+R
- Airport Tegel - Expo North Flughafen Tegel - Expo Nord
- Airport Tegel - Expo South Flughafen Tegel - Expo Süd
- Airport Schönefeld - Expo North Flughafen Schönefeld - Expo Nord
- Airport Schönefeld - Expo South Flughafen Schönefeld - Expo Süd
- Hotel Transfer
- City Transfer
- Fairground Shuttle - Geländeshuttle
- Fast Shuttle
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- South Entrance - East Entrance Eingang Süd - Eingang Ost
- East Entrance - Outdoor display Eingang Ost - Freigelände

ADIF



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ADIF is the main Spanish Infrastructure Manager, attached to the Ministry of Public Works. The company is in charge of building new lines, upgrading and maintaining the existing ones, as well managing rail traffic, meeting the highest safety requirements, stations and freight terminals.

Adif is one the biggest companies in Spain, the main investing company in the country for years. It manages a 15.400 km-long network, including High Speed and conventional lines, as well as 2000 stations. Adif, alongside the Spanish rail sector companies, gather 25 years of highly valuable experience in the design, construction and operation of the new Spanish rail network, an expertise that we now share with countries around the world, such as India, Saudi Arabia, Sweden, Denmark, Turkey etc....

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► Hall 22 / Stand 704

ALBATROS



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Technology company, subsidiary of Schaltbau, specialized in the design and manufacture equipment for trains, metros and trams. Headquarters located in Spain and factories in USA and Brazil.

Divisions: Power Electronics (static power converters and battery chargers) and On-Board Systems (PACIS, control systems and other embedded systems) SEPSA products stand for high quality, high reliability and a long design life. The QM system is certified in accordance with ISO 9001 and its eco-management system in accordance with ISO 14001.

The company has been quality-certified in accordance with IRIS and CMMI-DEV Model.

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► Hall 2.2 / Stand 102

ALSTOM



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Alstom showcases at Innotrans its contribution to the transition towards more sustainable transportation by designing and delivering innovative, environmentally-friendly and efficient mobility solutions. As a major player of the environmental revolution, Alstom presents its enlarged range of sustainable solutions in rolling stock (the Coradia iLint hydrogen regional train, the Prima H4 bi-mode locomotive, and the Aptis e-bus), charging infrastructure technologies (SRS for trams and buses, APS for road), energy efficiency and eco-design. As a mobility maker in the era of digitalization, Alstom showcases its latest developments and innovations for passengers and operators (passenger experience, the Iconis security control center, Mastria and data analytics for multimodality).

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► www.alstom.com

► Hall 3.2 / Stand 306

AMURRIO FERROCARRIL Y EQUIPOS



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Amurrio Ferrocarril y Equipos, SA is one of the international leaders in the design, manufacture, installation and maintenance of railway turnouts for High Speed lines, Conventional Rail, Subway, Tram and Heavy Haul.

Another of Amurrio's specialties is the design and manufacture of monobloc crossings in manganese steel, which are designed, cast and machined in their own facilities.

Amurrio also designs and produces any other type of crossings, as well as track expansion devices and re-railers. And it has a technical office that provides innovative solutions for railway paths.

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► www.amufer.es

► Hall 26 / Stand 307

AQUAFRISCH S.L.



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High reliable maintenance equipment for railway depots.

Aquafrisch main manufactured products are Train Wash Plants, Bogie Wash Cabins and CET systems (Train toilets sewing systems) both in fixed or mobile possibilities together with water treatment plants. Other available equipments are Sand Filling Systems and Internal Rail Tank washers.

The company has over 20 years experience developing projects in more than 20 countries.

Aquafrisch has been certified ISO 9001, 14001 and OHSAS 18001 and practices a quality policy focused on reliable products tailored to customer needs and services with optimal solutions.

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► www.aquafrisch.com

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ARCELORMITTAL



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ArcelorMittal, as the steel industry leader in product and process innovation and as one of the leading suppliers of rails worldwide, is fully geared to meet the future requirements of the rail industry. This is made possible by leveraging our research and development capabilities.

ArcelorMittal has rail production facilities in Luxemburg, Poland, Spain and United States that offer a wide portfolio of products, covering rails for subways, trams, trains, light rails, crane rails, crossings, rail accessories, specialist in high-speed with over one million tons produced, and is present in infrastructure projects of over 30 countries.

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► www.rails.arcelormittal.com

► Hall 26 / Stand 307

ARDANUY INGENIERIA

Ardanuy

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Ardanuy is an engineering company specialized in the provision of consultancy services for railways and urban transport (metros, tramways, cable cars, etc). Over 1000 projects have been carried out in the Railway sector since the company's beginning till today.

The company was incorporated in December 1992 and currently employs a permanent team of over 180 fully qualified engineers and architects. Ardanuy operates mainly in Spain, where it has offices in Madrid, Barcelona, Valencia, Seville and Tenerife, and has worked in 5 continents. Ardanuy currently has subsidiary companies in Lithuania, India, Algeria, Colombia and New York.



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► www.ardanuy.com

► Hall 5.2^a / Stand 104

ARTECHE (ELECTRONICA ARTECHE SMARTGRID)

artech

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Phone: +34 94 601 12 00

Arteche's expertise of more than 55 years manufacturing electromechanical relays technology gives the client the assurance of a technological leader. Our dedicated range of railway relays are designed to meet and exceed several railway industry standards in aspects such as vibrations (EN-61373) and fire behavior (EN-45545-2), among other railway industry focused features.

Arteche relays have extremely high MTTF values. Its reliability and durability allow them to be used not only as a general purpose relay, but also in all kind of safety functions, both in on-board and in signaling applications, making them suitable to be used in circuits requiring up to SIL-4 safety integrity level.



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► www.artech.com

► Hall 17 / Stand 107

BOMBARDIER

BOMBARDIER

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Bombardier Transportation is a global mobility solution provider leading the way with the rail industry's broadest portfolio. It covers the full spectrum of rail solutions, ranging from trains to sub-systems and signalling to complete turnkey transport systems, e-mobility technology and data-driven maintenance services.

Combining technology with empathy, Bombardier Transportation continuously breaks new ground in sustainable mobility by providing integrated solutions that create substantial benefits for operators, passengers and the environment all over the world. Headquartered in Berlin, Germany, Bombardier Transportation employs around 39,850 people and its products and services operate in over 60 countries.

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► www.bombardier.com



► Hall 2.2b / Stand 101

CAF

CAF

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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, light rail vehicles and tramways.

For more information, please visit our website.

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► www.caf.net



► Hall 4.2 / Stand 104

CAF INVESTMENT PROJECTS

CAF INVESTMENT PROJECTS

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CAF is the responsible for Ferrocarriles Suburbanos System 1 Concession for a period of 45 years. The project covers the construction, operation and commercial management of the railway, in addition to the provision of a public rail service. This line covers the route Buenavista-Cuautitlan and joins Mexico City with four nearby municipal districts. CAF also participates in the construction of a 57 km railway line between Mexico D.F. and Toluca. The project includes the supply, installation and commissioning of rolling stock, signalling, communication systems, control centre, electromechanical systems of the tunnel and viaduct, tracks and energy systems, and construction of two traction substations and technical buildings in the line. CAF is the leader of the consortium of this project for the Secretaria de Comunicaciones y Transportes (SCT).

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► Hall 4.2 / Stand 104

CAF MIIRA

MiIRA CAF

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CAF MiIRA is a global reference in the supply of critical components and comprehensive solutions for rolling gear and coupling systems, providing state-of-the-art engineering, manufacturing and maintenance capabilities for a complete portfolio of extensively proven solutions. MiIRA rolls forward with new innovation, continuous product optimization and a mentality to ensure customer satisfaction.

Currently MiIRA is supplying all type of complete wheelsets; monobloc and resilient wheels, axles and gearboxes, besides an extensive portfolio of couplers for any rolling stock, from locos or freight to light rail vehicles or high speed.

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► www.cafmiira.com



► Hall 20 / Stand 312

CAF POWER & AUTOMATION



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CAF Power & Automation goes beyond the design and development of traction, control, and energy storage systems. Our commitment to create modular and integrable systems makes possible to incorporate all our solutions into new vehicles and those currently in service. This ensures fleet modernisation and maintenance cost reduction. This specialisation has opened the international locomotive market for us in countries such as Italy, India and the USA. We have uncompromising passion in our work to support and advice all your decisions throughout the operating life of the product. Discover the power of adaptability by the hand of CAF Power & Automation.

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► Hall 4.2 / Stand 104

CAF SIGNALLING



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CAF Signalling is a world reference in the design and implementation of rail control solutions for the railways industry. CAF Signalling boosts its own in-house engineering and expertise to undertake "turn key" railway signalling projects with recognition from Administrations over Europe, America, Africa, Middle East and Asia. Headquartered in Spain, CAF Signalling is a leading reference in ERTMS/ETCS and rail control solutions for every type of rail system: main lines, high speed, light rail, metros and freight. The company uses its own technology following the highest European standards and certified by recognised certification bodies for SIL4 and interoperability.

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CAF TURNKEY & ENGINEERING



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CAF Turnkey & Engineering is a leading company in the provision of multidisciplinary comprehensive engineering, specialized in the design, project management, construction, commissioning and maintenance of infrastructure projects specializing in rail transport systems. Its headquarters in the Bizkaia Science and Technology Park (Zamudio) from where our highly qualified staff of over 250 professionals offer global and integral solutions to our clients throughout the entire project cycle, including operation and maintenance of the infrastructure.

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► www.cafte.com

► Hall 4.2/ Stand 104



La mejor solución para el transporte
de viajeros y de mercancías entre
España y el resto de Europa

The best solution for passengers and
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International Section Perpignan – Figueras, your best mobility vector

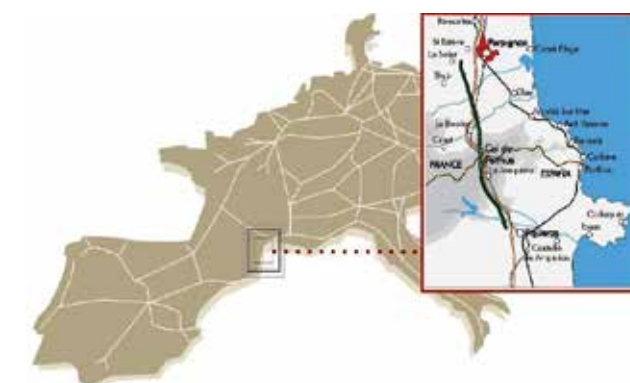
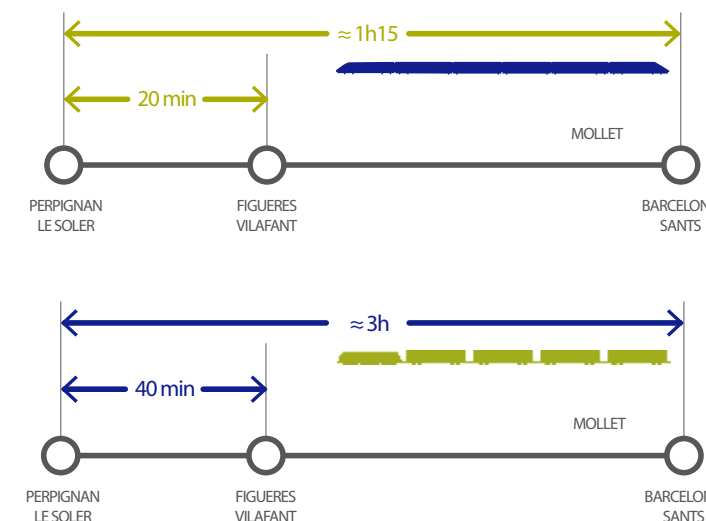
Located in the heart of the Mediterranean Corridor and Rail Freight Corridor nº 6, the line is a major link that connects the Spanish rail network with the French rail network, as well as with all the other European countries, with no disruption, no transshipment and no stop and under unbeatable rapidity, safety and comfort conditions.

Genetically designed for mixed traffic, the International Section allows simultaneous operation of high-speed trains operating at 300 km/h, regional trains operating at 160, 200 or 220 km/h and freight trains operating at 100 or 120 km/h. Trains cross each other with no restrictions. The line offers a capacity of more than 100 trains per day.

The gage allows the operation of all freight trains, including rolling-motorways (piggyback trains) and hazardous materials, lengths of up to 850 m and 22,5 t axle loads.

According to the type, one 4-axle locomotive can operate up to 1.300 t trains, whereas a 6-axle locomotive can operate approximately up to 1.800 t trains.

Territory development tool at the service of mobility, the International Section is currently the quickest, safest and most cost-effective mean, for both persons' mobility and goods' transport by rail.



CEIT IK4



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CETEST



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CETEST, railway testing

Fully accredited ISO17025, experts in railway vehicles and components testing (structural & fatigue, static tests, ride dynamics, noise, vibrations, EMC...). Their offering covers a wide variety of component test benches at their facilities as well as portable ones. They provide a global on-track measurement deployment capacity. Anywhere, anytime.

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



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COLWAY FERROVIARIA S.L., a company belonging to the COLWAY group, specializes in the design, engineering, manufacture, supply, installation and commissioning of turnkey railway vehicle interiors and toilet modules. Both for new rolling stock and for material to be modernized.

Through the integrated management of modular supplies and systems, based on experience, knowledge, research and innovation, the company achieves the satisfaction of the needs and expectations of its customers: railway constructors and Public Administrations.

Its work is based on the application of strong values: commitment, professionalism, ethics and agility.

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COMSA



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With over 125 years of history, COMSA is highly-specialized in turnkey railway projects covering the construction and maintenance of infrastructure and superstructure, electrification, control and communication systems for high-speed and conventional railway, metros and tramways.

The company has a leading position in the Spanish railway market, where it has been involved in the development of all high-speed lines, and has exported its know-how to the main European and Latin-American markets. COMSA is currently located in 17 countries.

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DANOBAT



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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 specialized companies.

DANOBAT solutions include in-house technological developments based on industry 4.0 concepts with an aim in advancing the creation of intelligent manufacturing spaces, fitted with interconnected equipment and capable of autonomous operation.

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DURO FELGUERA RAIL



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Specialized Company for the design, manufacturing and supply of turnout systems and their components, covering a wide range of applications: from tramway to high speed turnouts, passing by metro or conventional turnouts (crossovers, double slip crossings, , ...) assembled on wooden and concrete sleepers or on slab track, with Manganese steel crossings or swing nose crossings.

Insulated glued joints. Foundry designing, manufacturing and supplying Manganese steel casted crossings up to 11 meters long. CNC machining, flash butt welding, explosive hardening, static and dynamic bending tests, ...Design and manufacturing of transition rails.

✉ dfmail@durofelguera.com
www.durofelguera.com

► Hall 26 / Stand 307

EJE OGI (OGI AXLE)



Almendralejo, 5
41019 Sevilla (SEVILLA)
Phone: +34 95 499 93 20



In order to solve the problem of breaks of gauge between the different railway networks in rail freight, the consortium composed by Azvi, Tria and Ogi, as well as Adif, has developed an automatic variable gauge system made up of variable gauge axles and a gauge changeover facility. OGI axles have successfully completed Laboratory and On-Track Tests, as well as the first 100,000 km of the In-Service Tests set out by the Spanish ETH standard, and they will obtain the provisional Technical Approval for commercial operation.

info@ogiaxle.com
www.ogiaxle.com

Hall 22 / Stand 704

FLEXIX



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T: +34 94 497 71 80



Flexix develops, manufactures and sell worldwide injection and extrusion rubber parts, rubber-metal, rubber-plastic and assemblies. We belong to Kächele-Flexix Group, with plants near Stuttgart and Munich (Germany), Zamudio (Spain) and a logistic warehouse in Houston (USA). Our products for the railway sector, are mainly for infrastructures, absorption of vibrations under track, tie pads for sleepers, with different stiffness, new developments, materials, competitiveness, non-conductivity (or yes, if necessary), non-harmful gases. Type of parts Flexix produces: Ducts, bellows, tubes, silentblocks, joints, bumpers, axles, links, valves, bearings. Mixtures: nr, sbr, epdm, cr, nbr/hnbr, eco, aem, acm, vmq/silicone, fkm/fpm.

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www.flexix.com

Hall 21 / Stand 202

FUNOR,SA



Polígono de Villalonquejar Calle Condado de Treviño, 41 09001 Burgos (BURGOS)
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Funorsa is a Steel casting foundry in Burgos, Spain, specialized in high quality, safety and responsibility castings. With 48 employees, we supply pieces from 5 kg to 1.300 kg in a flaskfree semi automatic line to the main railway manufacturers. Funorsa cast Carbon Steel, alloy Steel and Stainless Steel, focused in the quality and long term partnership.

info@funorsa.es
www.funorsa.es

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GAMARRA



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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.

► gamarra@gamarras.es
► www.gamarras.es

► Hall 1.2 / Stand 209

GMV



Juan de Herrera, 17 - P.T.B. Boecillo
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GMV is a leading firm in the design, development, implementation and rollout of Intelligent Transportation Systems (ITS) based on IoT, mobile communications and GNSS, guaranteeing compliance with sector standards such as GTFS, SIRI, NeTEx and CAN bus. GMV offers all-in, turnkey, ready-to-go solutions, getting involved in the complete development of the project and incorporating its own inhouse hardware and software along the way.

With over 400 clients in 35 countries from 4 continents, our clients vouch for GMV as a worldwide trailblazer in the design and implementation of intelligent transportation systems.

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► Hall 2.1 / Stand 412

GOAL SYSTEMS



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Spanish company specialist in IT systems' development and deployment to plan the transport operations by using the most advanced optimisation techniques. Its main purpose is to solve the most complex planning problems, ensuring the highest profitability, competitiveness and sustainability of its clients.

To provide specific solutions for each sector, for public agencies and urban transport or long-haul transport companies, for passengers or goods transport, road, rail, boat or plane transport. It is specialized in vehicles and drivers planning, schedules creation, drivers' allocation, daily re-scheduling, and resources control and dispatcher.

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GORATU MAQUINAS HERRAMIENTA



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Geminis machines are specialized in machining of axles, wheelset and wheels. Geminis has a track of more than 60 years supplying highly demanding machining solutions and service all over the world.

One of our more important characteristic is the customizing capacity of our solutions. This has been highly considered in the GR3-W design to fulfill all customer needs.

The Geminis GR3-W is a wheel hub boring machine and it will be presented to the professional public for the first time at InnoTrans 2018.

► sales@goratu.com
► www.goratu.com

► Hall 22 / Stand 701

ICON MULTIMEDIA



Avd. Santiago Amón, 3-52-
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ICON Multimedia, which has over 25 years of experience in the market, offers the development of Traveler Communication Solutions and Digital Signage, what we could applied to all transport areas, stations.

Its DENEVA platform has more than 40,000 emission points, and includes wayfinding systems, audience measurement, or the traveler experience measurement based on emotions. DENEVA offers the possibility of using these systems by third-party companies, reducing public infrastructures costs, and improving the return on investment obtained.

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► www.iconmm.com

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IKUSI



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Ikusi, engineering and technology development for business digital transformation.

Ikusi is a Company, which provides services and digital solutions, which improve operational efficiency, revenue and user experience, by means of cutting edge technology which drives digital transformation which is produced in all sectors.

Ikusi is part of Velatia, an international technologically-driven industrial group whose activities are focussed in the field of electrical networks, electronics and communication networks, as well as in consultancy, security and aeronautics.

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► www.ikusi.com

► Hall 4.1b / Stand 307

IMPLASER 99

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IMPLASER is a Spanish manufacturer of a wide range of PHOTOLUMINESCENT products (signs, floor markers, tunnel and metro exit signing doors) with the highest and most competitive luminance levels in the market.

IMPLASER has a sound commitment towards quality and continuous improvement; our design, manufacturing and service procedures have been certified according to ISO 9001:2000 since 2001. Furthermore, we are the first Spanish Small and Medium Enterprise being certified in R+D+I (research, technological development, and innovation) (UNE 166002:2005).

Also, for all projects according NFPA 130 "Standard for Fixed Guideway Transit and Passenger Rail Systems" we have certificated our signs with UL.

► international@implaser.com
► www.implaser.com

► Hall 22 / Stand 704

INDRA

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Indra is one of the world's top technology and consulting and a technology partner for the key operations of its customers' businesses worldwide. It offers a comprehensive range of proprietary solutions and cutting-edge services with a high added value, and a unique culture of reliability, flexibility and adaptability.

Indra transforms and builds the mobility of the future with latest-generation solutions for the entire lifecycle and strong commitment to innovation, enabling Indra to be at the global forefront of the sector. Particularly noteworthy is its benchmark position in TMS, safety, fare collection, communications, consultancy and engineering.

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► www.indra.es

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INDUSTRIAL DE TRANSFORMADOS (ITSA)

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ITSA is a Spanish company specialized in the design and manufacturing of turnkey Railway Interior Components. We optimize costs, weights and sub-components through in-house engineering. When transforming different raw materials and creating products, ITSA uses a wide range of in house processes: FRP SMC, SMC + PIMC, RTM, PLASTIC INJECTION.

Additionally ITSA undertakes pultrusion, hand lamination, thermoforming, metal transformation and subcomponents processes through an expert panel of suppliers. We manage all phases of the project: Tool & Product design; Manufacturing; Finishing & assembly: Mechanizing, bonding, welding, painting, cabling; Packaging & delivery.

► emolar@itsa.es
► www.itsa.es

► Hall 3.1 / Stand 222

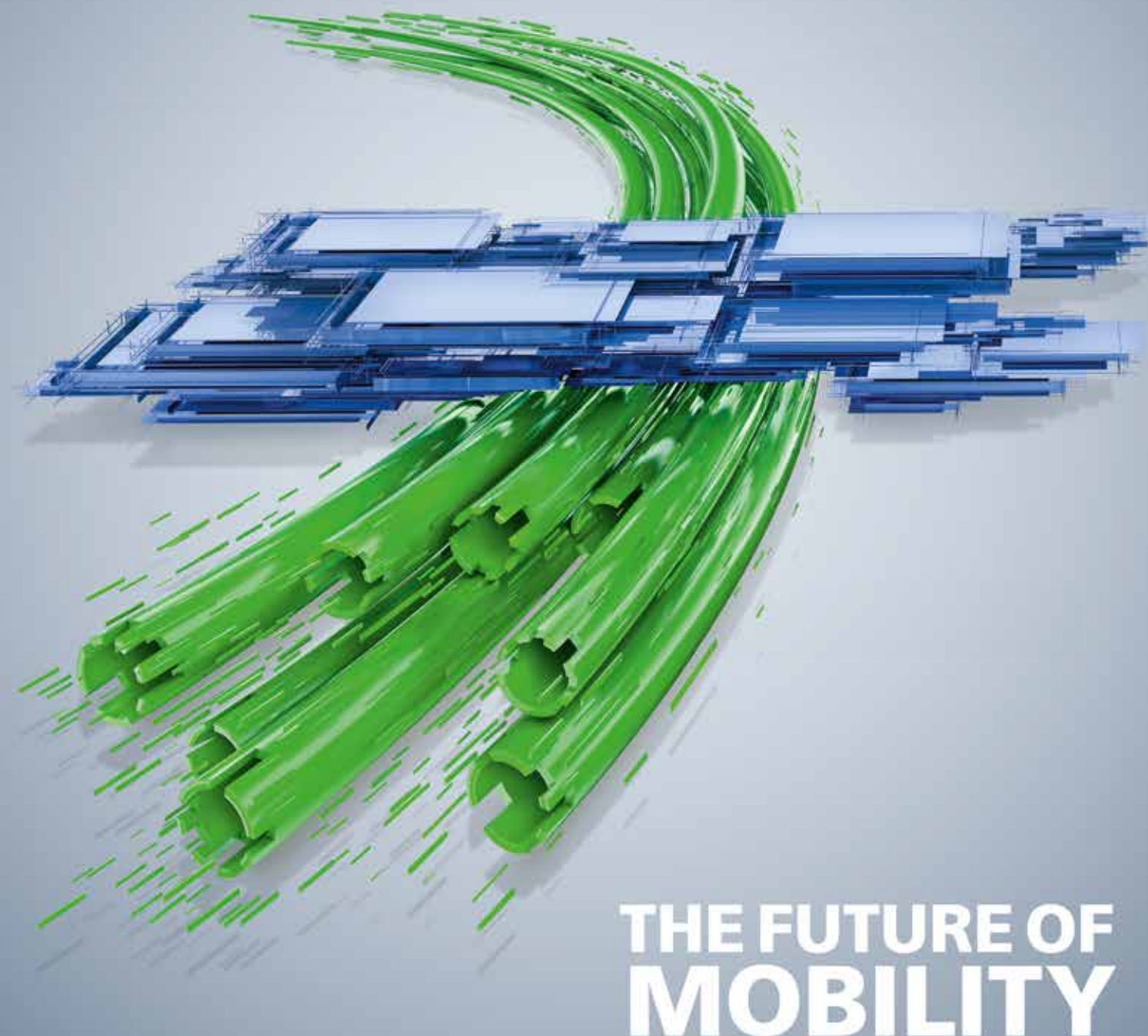


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INECO



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Ineco is a company with 50 years of experience and 3,000 professionals, with a high degree of technical specialization in engineering and consulting for conventional and high-speed rail networks, airports, air navigation, logistics, urban transport, ports and roads. It operates in 50 countries with comprehensive, innovative and technologically-valuable solutions, aiming to improve the mobility of people thanks to the development of sustainable and safe transport infrastructure.

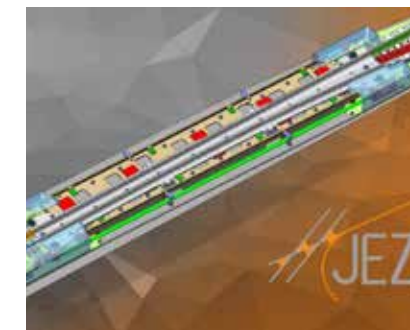
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Hall 5.2 / Stand 114

JEZ SISTEMAS FERROVIARIOS



Arantzar, s/n
01400 Llodio (ÁLAVA)
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JEZ Sistemas Ferroviarios is committed since 1924 to the designing, manufacturing and supplying of points and crossings. Our Technical Department, Department of R&D, ensures the capability of designing points and crossings (turnouts, crossovers, scissor crossovers and diamond crossings), or parts of them (hard steel manganese crossings, spare tongues...), including rail equipment standardization and installation projects for stations or depots and the development of tailor made solutions and own patents. In JEZ quality is our priority and therefore we have ISO 9001, ISO 14001, OHSAS 18001 and ISO 50001 certificates. JEZ has an after sales service which allows us to meet all the requirements of the customers, both national and international. In 2008 the subsidiary company MFA was created, which established production in France.

infor@jez.es
www.jez.es

Hall 21b / Stand 209

INGETEAM POWER TECHNOLOGY



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In the railway sector, INGETEAM offers traction systems for rolling stock and TCMS solutions. Our expertise on developing solutions for efficient exchanges of energy, is combined with know-how on rolling stock engineering to improve aspects that are key for vehicle manufacturers. INGETEAM operates in Asia, Africa, Europe and North and South America and has more than 3,000 employees.

traction@ingetteam.com
www.ingetteam.com

Hall 17 / Stand 201
Hall 6.2 / Stand 604

KELOX



Isla de Jamaica, 8
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Phone: +34 91 334 15 90



Kelox, within the Rail Interiors Division of the Satys group, specializes in the design and manufacture of on-board catering equipment for railway rolling stock.

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marketing@kelox.es
www.kelox.es

Hall 1.1 / Stand 223

INTERNACIONAL HISPACOLD



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HISPACOLD RAILWAY HVAC SOLUTIONS: specialists in passengers' comfort with first-class engineering quality. Hispacold, a World leader company for climate systems specialized in comfort for people with more than 30 years' experience. Hispacold designs and manufactures HVAC solutions for all rail vehicles: trams, metros, EMUs, DMUs, LRVs... with proven and reliable technology solutions. Hispacold's presence in the five continents guarantees the best technical assistance at any place of the world.

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Hall 3.1 / Stand 224

LA FARGA



Colonia LaCabra s/n 085089
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Phone: +34 93 850 41 00



La Farga is a pioneering company due to its innovation in high service products for railway applications. It has developed new products and new alloys with the aim of introducing the best copper solutions into the market.

We offers the full range of copper products and alloys for the catenary employed in the railway market (contact wire -CuETP, CuAg, CuMg, CuSn-dropper for messenger cable, messenger, electrical connection and static point cable), using an integrated process based on pure copper from the mine. Our service includes technical visits and assessment to our clients.

gustau.castellana@lafarga.es
www.lafarga.es

Hall 22 / Stand 311

LANDER SIMULATION AND TRAINING SOLUTIONS



Portuetxe, 23º Local B3
20018 San Sebastián (GUIPÚZCOA)
Phone: +34 943 21 74 91



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.

► aohlsson@landersimulation.com
► www.landersimulation.com

► Hall 4.2 / Stand 104

LIMMAT GROUP



C/ Cuellar, 11 -1º
40003 Segovia (SEGOVIA)
Phone: +34 943 101 863



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

► Hall 22 / Stand 704

MB SISTEMAS



Pol. Ind. Igeltzera - C/ Igeltzera, 8
48610 Urduliz (VIZCAYA)
Phone: + 34 94 403 06 26



MB SISTEMAS S.Coop. offers cutting edge solutions in automated & robotic installations. We are specialists in assembly & welding lines for passenger and freight rail car manufacturing.

Our team achieves maximum competitiveness for your project. We manage all joining technologies (gluing, spot welding, MIG/Mag welding, laser welding...). Both materials, austenitic steel and aluminium are no problem for our team.

Let us know about your challenges and we will find the best solution for you. Let our team engineer your solution!

► amacias@mbsistemas.es
► www.mbsistemas.es

► Hall 22 / Stand 804

MAFEX SPANISH RAILWAY ASSOCIATION



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The Spanish Railway Association (Mafex) has as its purpose serving the Spanish railway sector, by helping its companies in their internationalisation processes and defending the general interests of their associated companies in order to achieve, through cooperation, the highest possible level of competitiveness thereto.

Its activities include the coordination of an agenda of trade delegations and missions to promote and open markets; the dissemination of information of interest to the partners, as well as the institutional communication with diverse national and international administrations. In order to respond to the new challenges of the sector and support the technological leadership of the industry, Mafex also has an innovation and competitiveness committee.

Mafex, is an official collaborating body of the Secretary of State for Trade of the Ministry of Economy and Competitiveness, has the support of the AGEX GROUP to which it belongs and other institutions such as UNIFE (Association of the European Railway Industry) and ALAMYS (Latin American Association of Subways and Subways).

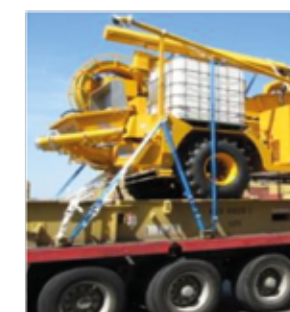
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METALOCAUCHO



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MTC is specialized in the design and manufacture of rubber-metal suspension systems for the railway sector. MTC is part of Wabtec Corporation, and currently has production plants in Spain (HQ), China, India and US. Leading company in this sector, MTC works with the main manufacturers of global rolling stock, such as Alstom, Bombardier, CAF, CSR, CNR, Hyundai Rotem, Siemens, Talgo, Stadler. Also has earned the trust of Operators for the supply of spare parts for maintenance of their projects. MTC main products are primary and secondary suspensions and different subsystems for bogies.

► info@metalocho.com
► www.metalocha.com

► Hall 1.2 / Stand 105

NEWTEK SOLIDOS



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NEWTEK, founded in 1987, is a Company dedicated to the design of installations for the handling of bulk materials – dust and granule size solids – for different sectors of the industry. It supplies complete facilities mainly composed by a storage silo, fixed or mobile sand filling systems and a dust suction system that allows a safe loading in an environmentally friendly way. Newtek carries out specific designs adapted to each client to offer the best solution and it has a wide and varied catalogue, with proven performance in facilities worldwide.

► comercial@newteksolidos.com
► www.newteksolidos.com

► Hall 22 / Stand 704

MGN TRANSFORMACIONES DEL CAUCHO



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MGN was founded in 1957 and since then the company develops its activity designing and manufacturing rubber to metal components mainly for the railway sector. We are committed with the research and innovation as a fundamental basis for the development of new components integrated into the new concepts either passenger or freight trains, by adopting the most modern technological advances in the world of rubber, vibration control systems.

► enp@mgncaucho.com
► www.mgncaucho.com

► Hall 9 / Stand 602

PREMIUM



Dolors Aleu 19-21
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Premium is a world-class manufacturer of highly-engineered standard and custom AC Power Supplies, DC/AC Inverters, DC/DC Converters and Battery Chargers. Our extensive experience (more than 35 years) allows us to design, test and manufacture custom products to many different stringent specifications. We can also perform tests such as Temperature, Humidity, Shock and Vibration, EMC and so on. The main advantages over our competitors are our low NRE costs and the short schedule to production. We can offer a reduced overall program cost, especially for low volume production requirements.

► sales@premium.es
► www.premium.es

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NEM SOLUTIONS



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NEM Solutions offers data analysis solutions for the generation of normal machine behavioral diagnostics. In the current Innotrans edition, opt for translating knowledge obtained from raw data into services. With the purpose of implementing predictive maintenance strategies closely linked to technological change, through our A.U. R. A platform NEM Solutions offers its in-depth knowledge of data analysis, as well as its dominant position in the Railway sector. With a customer accompanied service in order to extend the life cycle of train assets, in this way NEM Solutions manage to both improve availability conditions and reduce costs.

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► www.nemsolutions.com

► Hall 21 / Stand 408

RENFE



Gerencia de Área de Cooperación Internacional y
Relaciones Institucionales
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Renfe Operadora, a Spanish public company (Ministry of Transport and Infrastructure, Government of Spain), is one of the most significant railway operators in the world because of its experience in high speed, regional and commuter services. Renfe runs more than 5.000 trains daily and it is a central actor in the transport system of the country, with more than 487 million passengers and 19,6 million tons of freight moved in Spain 2017. With more than 25 years running high speed services, the company offers consultancy and knowledge in the international markets. Renfe has a long experience regarding cooperation, international trains with France and Portugal, and projects as Haramain, where Renfe has provided training on different levels, maintenance depot designs and will be operating High-Speed trains in Saudi Arabia connecting Makkah and Madinah.

► internacional@renfe.es ► www.renfe.com

► Hall 22 / Stand 704

REVENGA SMART SOLUTIONS



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Phone: +34 91 806 18 10

Revenge Smart Solutions offers end to end solutions for the Transport, Telecommunication and Security sectors.

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SECURITY & DEFENSE: CCTV & Video Analysis, UAVs, Scanners; Access Control; Fire Detection

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



► Hall 22 / Stand 706

SIEMENS MOBILITY



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Phone: +34 91 514 80 00

Siemens Mobility offers answers to the current and future mobility demands with its comprehensive portfolio of solutions and services: Mobility Management, Turnkey Projects & Electrification, Rolling Stock and Customer Services, besides its wide competence in intelligent traffic solutions.

Siemens Mobility has the know-how to make road traffic flow more smoothly and quickly, make trains more environmentally friendly and efficient and freight shipments more reliable. We work with our customers to develop optimal solutions to help overcome their challenges.

► www.siemens.es/railautomation



► Hall 4.2 / Stand 201

SEGULA



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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, pharmaceutical and oil & gas.

Present in 28 countries and with 140 offices worldwide, the Group fosters a close relationship with its customers thanks to the expertise of its 11,000 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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► www.segula.es



► Hall A - Stand 403

STADLER



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Stadler provides a comprehensive range of products in the heavy and urban transport segments: High-speed trains, intercity trains, regional and commuter rail trains, metros, tram-trains and trams. Furthermore, Stadler also manufactures main-line and shunting locomotives, passenger coaches and it is the world's leading manufacturer in the rack-and-pinion rail vehicle industry.

Discover seven unique innovations from Stadler at InnoTrans2018: from a Tailor-Made train composition to the innovative driverless metro; from the newly designed regional train to the last generation of 6-axle locomotives designed and manufactured by Stadler Valencia to optimize the rail freight transport throughout Europe.

► stadler.valencia@stadlerail.com
► www.stadlerail.com



► Hall 7.1c / Stand 208
► Hall 2.2 / Stand 103 and outdoor 0/615

SICE



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SICE is a multinational technology Integration Company operating in the fields of traffic and transport, energy, telecommunications and all types of industrial processes.

SICE's activity mainly focuses on providing added value services through the integration of a range of in-house and third-party technologies.

SICE is currently supplying fare collection and railways communications systems for Metro de Madrid (Spain), Metro de Santiago (Chile), Metro de Lima (Perú) and Metro de México.

We have also delivery Intelligent Transport Solutions in Australia, UK, New Zealand, USA, Canada, North Africa and Middle East (Saudi Arabia, Qatar and Emirates).

► sice@sice.com
► www.sice.com



► Hall 4.1/ Stand 402

TALLERES ALEGRIA



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Phone: +34 985 26 32 95

Talleres Alegria, s.a. is a family owned company devoted since 1900 to design, manufacturing and after sales assistance of turnout systems, as well as Design, manufacturing, repair and maintenance of self propelled vehicles and freight wagons.

► talegria@talegria.com
► www.talegria.com



► Hall 26 / Stand 307

TALLERES CORRAL MECANIZADOS TalleresCorral

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: ISO9000, EN15085 CL1, DIN 6701 A2, ISO3834 and DIN2303 Q3.

In production of pressure vessels, for brake and air conditioned systems, TalleresCorral is certificated in module H category I, II and III of PED 97/23/EC 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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► Hall 22 / Stand 805

TELICE

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TECHNOLOGÍA PARA EL TERRESTRE

We design, install and maintain rail electrification, signaling and communication systems for the rail and industrial sector. Our mantra is "Technology on the field" which is consistent with our mission for providing state-of-the-art technology and experience at a competitive price.

At Innotrans we are not only showcasing our know how and expertise as main contractors or general subcontractors, but we are also featuring the results of our R&D efforts aimed at enhancing railway technology, including our revolutionary TCat Workstation for Overhead/Catenary lines.

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TECNATOM

tecnatom

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Tecnatom is an engineering company created in 1957 to provide services to the nuclear industry, that has diversified its scope to other industrial sectors such as aeronautics and rail. The company has a large international component with subsidiaries in France, Mexico, Brazil, Emirates, USA and China.

Its activity focuses on the development of automated systems for the inspection of components through non-destructive testing -manufacturing and in-service maintenance-, covering rolling stock -wheels, axles, bogies- and rail. Its products cover conventional NDT inspection and the new continuous monitoring technologies aimed at predictive maintenance.

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TELTRONIC

teltronic
a thyssen company

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With the combined objectives of innovation and the highest quality, 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.

The company offers TETRA, pure LTE broadband, as well as TETRA + LTE hybrid solutions that merge the highest reliability with a greater data capacity, an innovation guided by the availability and security required by mission critical users and that will enhance passenger experience, operational efficiency and maintenance activities. With more than 100 transport communication systems deployed worldwide, Teltronic has the expertise and the most complete portfolio of products to provide integrated solutions.

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TECNIVIAL

TECNIVIAL

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TECNIVIAL is a specialist company in all kinds of FIXED SIGNALLING and MARKERS BOARDS, both conventional and high speed line. The main products in which TECNIVIAL is an expert are:

- Fiberglass, metal sheet or aluminum signs and signals, with modular mounting systems and reflective decorations, in accordance to Standard EN 12899-1 (CE MARKING). Now, the future signalling; NANOTEC COMPOSITE, the incorporation of cutting-edge materials (carbon nano particles) to the manufacture of signs.
- Luminous three-dimensional signs and opaque signs for transport building exteriors, station concourses and platforms.
- Provisional luminous work/vehicles signalling.
- Railway station signalling in accordance with corporate identity manuals.

TECNIVIAL is the first marker boards company for high speed lines in Spain

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THALES SPAIN

THALES

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Thales occupies a leading position in control systems for transport thanks to its more than 65 years' experience in Spain and its important contribution to modernising the Spanish railway network and to its participation in high-speed and main lines projects.

With the deployment of ERTMS and signalling systems in a large part of the Spanish high-speed network, it has managed to become a national and international reference point, contributing to maintain and improve the functioning of the second largest network in the world.

The Company exports some 40% of its total output, chiefly to markets in North Africa, the Middle East and Latin America.

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UROMAC SYSTEMS



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UROMAC SYSTEMS, S.A. is a company with a great experience in the manufacturing of 4x4 vehicles and machines for the railway sector, construction, mining, forest and military sectors.

UROMAC is specialized in road-rail vehicles and machines being the first complete manufacturer of this type of machines and vehicles specially engineered and designed for this function. UROMAC covers the whole process from design, manufacturing and delivery according to customer specifications and standard and regulations.

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VIRLAB TESTING LABORATORY



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VIRLAB Vibrations Testing Laboratory is an Urbar Ingenieros Group company that was established in 1976. Virlab develops his activity in the field of vibrations and shock testing of all kind of electrical, mechanical and I&C equipment of any economic sector.

More than 2,700 tests have been performed until June 2015, concerning to economic sectors such as Energy, Railways, Defense, Transport, Aeronautical or the Automotive.

The laboratory is accredited by ENAC, the Accreditation Spanish Entity and homologated by the Group of Spanish Nuclear Power Plants Owners.

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XUBI ENGRANAJES



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Xubi was founded in 1956, and is currently one of the largest gear companies with a most diversified gear capacity. Xubi produces spur and helical gears, internal geared rings, bevel gears with spiral, helical or straight teeth.

Over 5 decades supplying to the railway industry worldwide, Xubi's experience and quality offers a reliable solution for all kind of transmission needs in the railway industry.

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Smart windows for Barcelona Metro

PILOT R&D PROJECT DEVELOPED BY THE SERVICES TEAMS OF ALSTOM IN SPAIN.

Barcelona Metro Line 2 will be equipped with smart windows over the next few months. A pilot project developed by the R&D teams of the Services unit of Alstom Spain, which will implement a metro line with "smart" windows for the first time.

During 6 months, the line 2 of the Barcelona Subway, opera-

ted with Alstom Metropolis trains, will become a showcase of the project "Wake up my Windows". This project, promoted by Alstom's innovation department, aims to improve passengers' experience. Across the Barcelona city center metro network, these smart windows will inform passengers about places of interest, commutes, weather, tourist info, transport alternatives etc.

The city transport operator, TMB, has received this project with special interest, as its innovative format can not only improve the experience of passengers, but also create new sources of income for

the operator, which can offer new advertising formulas and platforms, adapting them to the location of the train in real time.

Passenger experience: a priority

In a context of more competition between transportation modes, passenger experience is essential for operators and a key element to build customer loyalty. Therefore, Alstom has developed innovative technologies and solutions, such as the one that is going to be tested in the Barcelona Metro.

Moreover, a dedicated division for on-board experience promotes these initiatives in all business units.





New grooved block rail profile 53K2 (MSzTS52) production: a better performance for Tram applications

Our grooved block rails are manufactured following the EN14811 standard, meeting the same quality standards as conventional grooved rails. Grooved block rails have considerable advantages over conventional grooved rails:

- No rail web (the vertical part linking the head and the foot of a rail): 50% less height. Only 70 mm in height, which considerably reduces construction costs.
- Less weight: 5-10% lighter.
- Reduced noise: 5-10 dB less (due to not having rail web)

When it comes to performance, grooved block rails show excellent bending capabilities even down to Radius 20-25m. In addition, tests

WHEN IT COMES TO PERFORMANCE, ARCELORMITTAL GROOVED BLOCK RAILS SHOW EXCELLENT BENDING CAPABILITIES EVEN DOWN TO RADIUS 20-25M.

have shown improved stress capabilities for tram and even heavy rail networks when compared to conventional grooved rails.

ArcelorMittal Europe-Long Products produces two grooved block rail profiles: 53K2 (MSzTS52), and 57K2 (LK1). The main difference is the wider grooved width in the case of 53K2 (MSzTS52) with 45mm. Our grooved block rails have been installed in a variety of countries including: Germany, France, Italy, Hungary, Poland,

Czech Republic, Russia, Belarus, and in the United States (New York City, Washington, Portland, Dallas and Pennsylvania).

To complete the tram lines 49, 56, 61 and extend line 17 of Budapest tramway, ArcelorMittal is supplying over 1,000 tonnes of grooved block rails produced in Rodange. Onsite deliveries have already started and will continue up to the completion in 2018.

More info: <http://rails.arcelormittal.com/products/tram-rails>

The new locomotive TRAXX DC3 is unveiled



THIS IS A STATE-OF-THE-ART LOCOMOTIVE DESIGNED BY BOMBARDIER, ABLE TO MAXIMIZE ENERGY EFFICIENCY, ENSURING GREATER LOAD, TRACTION CAPACITY AND LOWER ENERGY CONSUMPTION.

For greater efficiency and lower operation costs, the TRAXX DC3 has also been designed around the freight industry's latest digital maintenance solutions. Intelligent platforms based on Conditional Based Maintenance, Big Data and IoT technology correlate data coming from the vehicle and the rail infrastructure to monitor the vehicle's health in real-time, predicting maintenance interventions, while guaranteeing maximum fleet performance and availability. The prototype converters of the

propulsion systems of these vehicles have been developed at Trápaga's factory (Basque Country).

Italian rail operators, Mercitalia Rail, Captrain Italy, GTS and Locoitalia are the first to have enhanced their freight service by purchasing the new TRAXX DC3. In addition to the 190 BOMBARDIER TRAXX DC locomotives delivered, there are currently 54 locomotives in the pipeline.

This is a state-of-the-art locomotive, able to maximize energy efficiency, ensuring greater load, traction ca-

capacity and lower energy consumption. One of the locomotive's most interesting features is its Last Mile function that offers new logistical concepts by enabling the locomotive to easily bridge non-electrified track sections often found in ports or freight terminals.

RENFE currently has 100 locomotives belonging to the Bombardier TRAXX platform (series 253), whose propulsion systems were developed at the Bombardier Trápaga's factory. The locomotives of the TRAXX family have been operating in Spain for years with a high development in both the Atlantic and Mediterranean corridors, which has served to highlight the maturity and experience of Bombardier in the manufacture of this type of vehicles



Leadmind, digital train

THE LEADMIND PLATFORM(CAF DIGITAL TRAIN) IS TO PROVIDE A NEW GENERATION OF TRAINS AND MORE COMPETITIVE SERVICES, FROM THE CONCEPT DEVELOPMENT PHASE TO THE OPERATION AND MAINTENANCE OF THE RAIL SYSTEM.

The main objective of the LeadMind platform is to provide a new generation of trains and more competitive services, from the concept development phase to the operation and maintenance of the rail system, through the collection, storage, advanced processing and analysis of all the data that the train currently generates or may generate in the future in a cybersecure way.

LeadMind Platform allows:

1. Have a modular and scalable product, customizable according to the client's requirements (operators, engineering and maintai-

ner of the fleet).

2. Generate driving recommendations for obtaining an efficient energy management of the train.
3. Optimize the way to register, collect and manage the information that is generated in a massive way.
4. Provide added-value information in a friendly format and decision-making tools to ease the decision making process by the different actors involved in the railway operation.
5. Increase the efficiency in maintenance tasks integrating real time

operating data of the train in the maintainer system to improve the diagnosis of the failures.

6. Eliminate black-boxes and exploit in a unified way representative variables of vehicle failure and maintenance activities (actions) as well as being able to perform cross-analysis of diverse information sources (meteorology, geolocation, tool for maintenance management, train, track, etc.).
7. Guarantee integrity in the collection, custody and use of data in the event of external attacks.

The examples of LeadMind tools include remote HMI, geolocation, fleet health based in Alarms information and CBM.

Technology for smart wheel machining

DANOBAT is to present its latest technology developed for the smart machining of wheels at the forthcoming INNO-TRANS trade fair, where it will exhibit preventive and corrective solutions for a wide range of vehicles. The company will also be showing its latest machine-tool solutions, high value-added production systems and fully flexible solutions tailored to the needs of the customer, integrating technologies developed in-house in the new paradigm of Industry 4.0. DANOBAT will take the opportunity provided by the fair to present its new generation of DHD underfloor wheel lathes. A robust, reliable so-

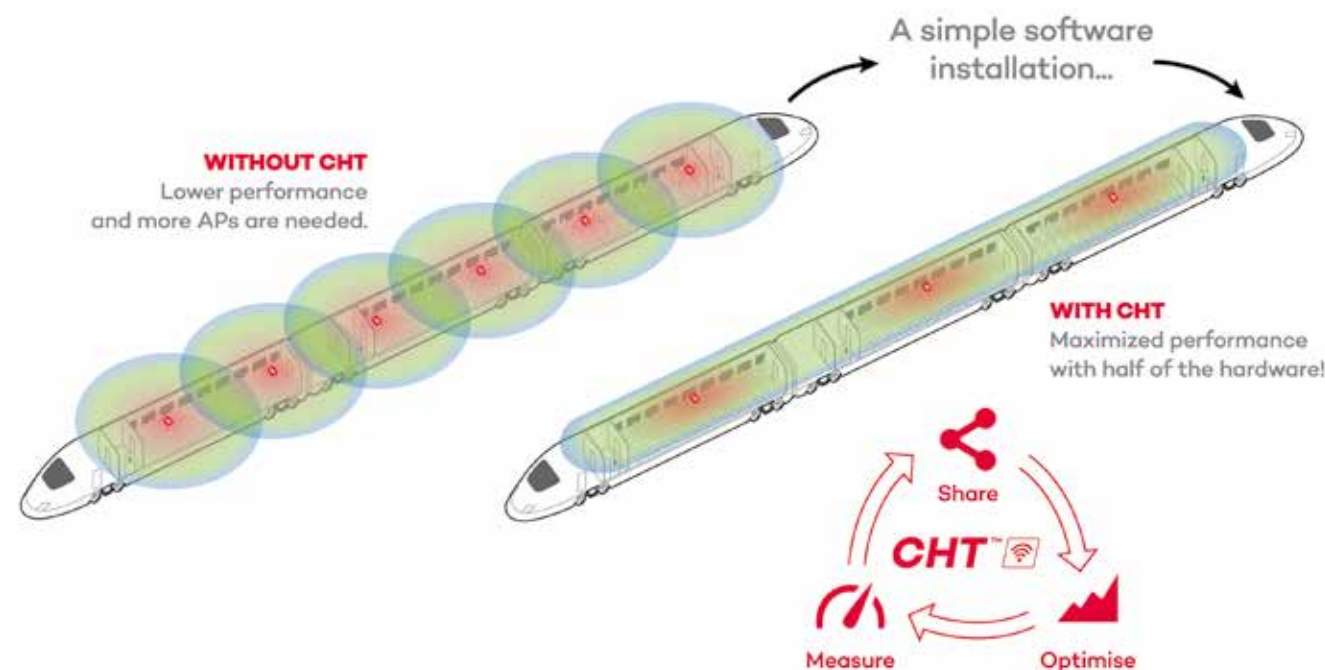
THE SMART MACHINING TECHNOLOGY DEVELOPED BY DANOBAT REDUCES CYCLE TIMES AND INCREASES PROCESS RELIABILITY AND SAFETY, THUS EXTENDING THE USEFUL LIFETIMES OF THE WHEELS OF RAILWAY ROLLING STOCK.

lution that provides a fully automatic machining process. Equipped with attachments for automatic hold-down device for inboard axleboxes and a continuous-contact high-precision measuring system. The machine recognises the measurements of each wheel, and the smart machining algorithm uses those data to select the optimum profile, minimising the reduction in wheel diameter and maximising

flange width. The SMART MACHINING technology developed by DANOBAT reduces cycle times and increases process reliability and safety, thus extending the useful lifetimes of the wheels of railway rolling stock.

The system is also designed to work in extreme climates and offers easy maintenance and calibration as well as high precision and repeatability in measurements.





Multivendor cognitive software to optimize the performance and operation of onboard **WiFi networks**

GALGUS (A WINNING SPANISH STARTUP WITH INTERNATIONAL FOCUS) HAS DEVELOPED AND PATENTED CHT (COGNITIVE HOTSPOT™ TECHNOLOGY), A SOFTWARE THAT MAY BE INSTALLED IN A WIDE VARIETY OF APS (ACCESS POINTS).

In a wireless world, to maintain and operate an onboard WiFi network in a train is almost impossible. System Integrators have problems to decide about which hardware to use. In this context, Galgus (a winning Spanish startup with international focus) has developed and patented CHT (Cognitive Hotspot™ Technology), a software that may be installed in a wide variety of APs (Access Points). CHT unleashes the potential of the WiFi infrastructure, optimizing resources and allowing advanced services like device location. And all of that without changing the hardware of the existing

WiFi network. Thus, the network owner decides that hardware satisfies its needs, and then installs our software. The main features are:

- Distributed intelligence: without central controller (without bottlenecks nor critical nodes).
- Retrofitting: maximize your already deployed WiFi network by installing CHT.
- Load balancing: dynamically distribute user between available resources.
- Automatic power and channel assignment: minimize interferences.
- Smart roaming: walk from one wagon to another one seamlessly.

- Cloud management: remote configuration and analysis.
- Localization, intruder detection, self-recovery, and self-configuration.

CHT no es un experimento, sino un producto maduro operando ya en entornos muy exigentes como aviones, autobuses y hoteles. CHT is not an experiment, but a mature product operation in very challenging environments like aircraft, buses, and hotels.

From 2017, Galgus has deployed its technology in trains with the aim of maximizing WiFi network performance in both already existing and new installations.

The groundbreaking onboard platform **Deepsy®**, on which several software developers can work collaboratively

The Mallorca Transport Consortium (Consortio de Transportes de Mallorca: CTM) will develop its own ticketing software, to include EMV payments within an account based ticketing (ABT) system. GMV has won the tender for the supply of technological components for the new fare system of the Consorcio de Transportes de Mallorca, which takes in the collective public transport of the Balearic Islands for intermodal bus, train and metro transport. GMV will roll out 1652 validators and 611 dual EMV/Smart-Card desks, 1247 video-surveillance cameras plus 611 inside information panels. GMV will also see to the adaptation in metro and train stations of 238 ticket barriers and 62 Ticket Vending Machines to allow the system to work with EMV technology

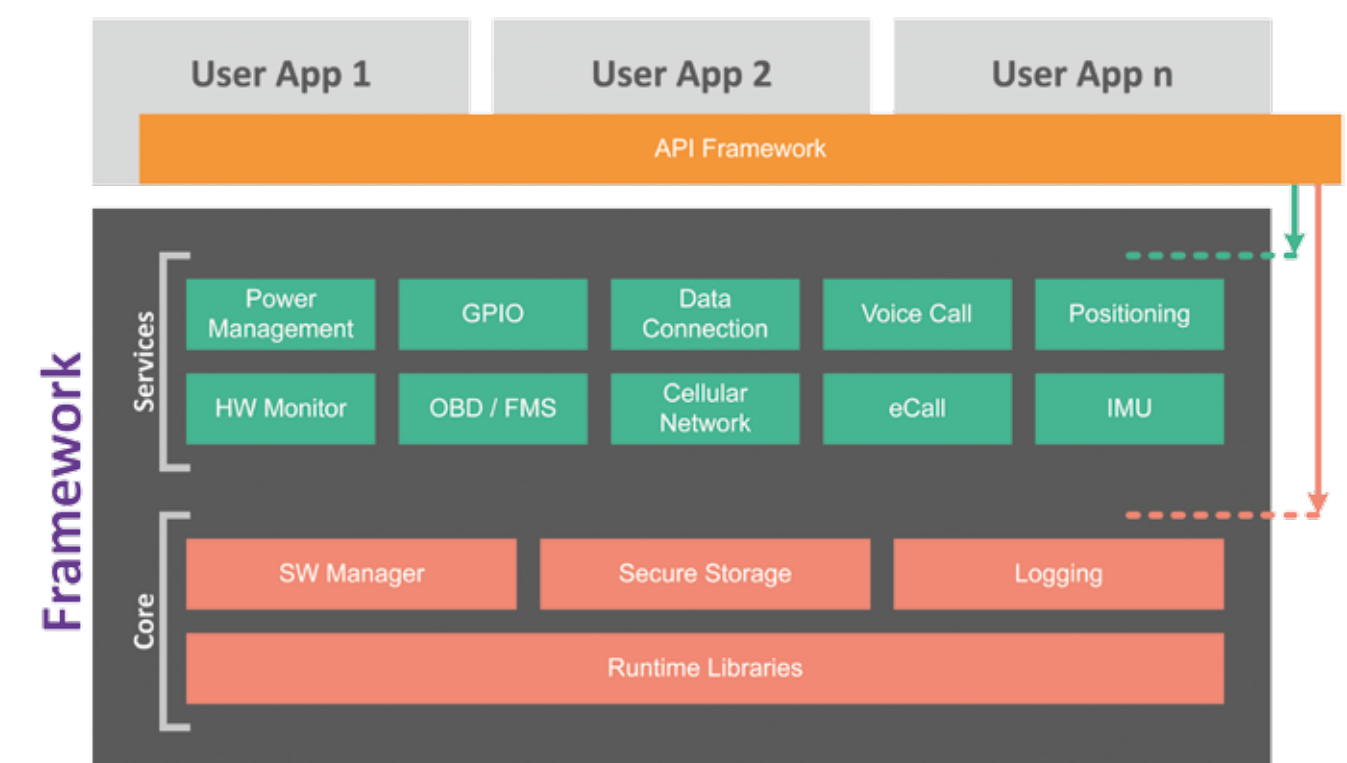
GMV WILL ALSO BE INCORPORATING ITS GROUNDBREAKING DEEPSY® PLATFORM, WHICH WILL ENABLE THE CONSORCIO DE TRANSPORTES DE MALLORCA TO DEVELOP ITS OWN ONBOARD TICKETING SOFTWARE REGARDLESS OF THE EQUIPMENT HARDWARE CONFIGURATION.

gy and the new payment platform. GMV will also be incorporating its groundbreaking Deepsey® platform, which will enable the Consorcio de Transportes de Mallorca to develop its own onboard ticketing software regardless of the equipment hardware configuration. In the particular case of the 200 buses of the Municipal Transport Company (Empresa Municipal de Transportes) of Palma de Mallorca, GMV will be developing the onboard ticketing software. The incorporation of EMV technology will allow any would-be passenger

with a physical or cellphone-virtual bank card to access the public transport system without previous registration and in the certainty of being charged the most favorable fare.



Runtime Architecture



Electrification of urban transport in the cities



IDOM IS WORKING ON OPTIMIZING THE CALCULATIONS OF THE ELECTRICAL INSTALLATIONS OF URBAN LIGHT TRANSPORT NETWORKS USING THE REPS (RAILWAY ELECTRICAL POWER SIMULATOR) TOOL CONNECTING THE TRAMWAY-LIGHT RAIL NETWORKS TO ELECTRICAL BUSES AND ELECTRICAL CHARGING POINT FOR ELECTRICAL CARS AND BIKES.

REPS is a specialized software tool, developed entirely by the IDOM R+D+I team, for the simulation and analysis of railway electrical networks, together with the analysis of the planned operating grids. This software has been used in the design of the Trams of Bilbao, Murcia and Zaragoza (Spain), Lund (Sweden), Ring 3 Copenhagen (Denmark) LRT, and Electrical BRT Vitoria (Spain). The design of electrical installations for a tram/LRT network, especially substations requires a great deal of

adjustment, to minimize the size and insertion of the substations in the city. Also factors such as EMC (electromagnetic fields) and energy regeneration are key aspects to be considered when designing in an urban environment. IDOM is one step further optimizing and providing energy to buses, bikes and car from Tramway grid, and integrating the charging points into the Tramway stops. The REPS simulator developed by IDOM has a powerful Graphical Interface to visualize / interact all

the elements, creating different scenarios on the urban light network and on the electrical system and analysing an endless number of operations situations, even in degraded mode. With this tool Municipalities, Urban Transport Operators could analyse the reduction in consumption for the combined network (buses, trams, ..) and the incomes from other business connected (electrical car charging points, electrical bikes rental..). The entire urban light transport network is simulated at once per system, both electrically and with different variants of the grid operations. The electric model is adjusted to real values measured during existing operations and can be calibrated with real measurements for each client in the case of in-service trains.

New smart and secure IOT generation for the railroad sector

Indra has started to develop and test new solutions designed to improve rail transport safety, efficiency, interoperability and service, as part of a new generation of smart, secure and reliable Internet of Things (IoT) systems. In the European R&D SCOTT project, co-funded by the Ministry of Energy, Tourism and Digital Agenda and the European Commission, Indra is working on innovating wireless communication-based solutions to interconnect infrastructure and train devices with control centers and cloud platforms for the streamlined and straightforward deployment of new services. These solutions will improve security and interoperability in critical areas such as level crossings, increase infrastructure capacity, determine and manage train configurations, and guarantee the mo-

IN THE EUROPEAN R&D SCOTT PROJECT, INDRA IS WORKING ON INNOVATING WIRELESS COMMUNICATION-BASED SOLUTIONS TO INTERCONNECT INFRASTRUCTURE AND TRAIN DEVICES WITH CONTROL CENTERS AND CLOUD PLATFORMS FOR THE STREAMLINED AND STRAIGHTFORWARD DEPLOYMENT OF NEW SERVICES.

onitoring of cars and loads, among other advantages. Indra is leading the industrial cases, as well as the railroad domain and the related use cases. The company also contributes its IoT secure processing hardware platform for rail transport InVITALRAIL, which can integrate all kinds of on-board devices, as well as those already deployed in the infrastructure. The aim is to develop V2X (vehicle-to-everything) wireless communications, move toward a secure smart platform that integrates the data provided by the different moni-

ring and control elements (such as sensors and actuators) and, based on these, develop multiple innovative applications to deploy new railroad services, reducing the need for investment and operating costs. This also enhances interoperability with other means of transport. These new developments boost Indra's leading position in smart mobility and secure IoT technologies for the railroad sector, scarcely explored until now due to the dependence on infrastructure based on cables and strict security requirements.



Human factors **integration** in safety assessments

THE NEED FOR FURTHER EVOLUTION IN SAFETY MANAGEMENT, HAS MOVED INECO TO DEVELOP A METHODOLOGY ADDRESSING THE HUMAN ELEMENT MORE THOROUGHLY AND EXPLICITLY IN SAFETY ASSESSMENTS, MAKING SYSTEM DESIGN MORE FIT TO HUMAN NEEDS.

Human Factors (HF) related issues are the cause of most accidents in transportation. This, and our need for further evolution in safety management, has moved Ineco to develop a methodology addressing the human element more thoroughly and explicitly in safety assessments, making system design more fit to human needs. The method has considered validated Human Factors methodologies and techniques to extract, simplify and integrate them in the safety assessment, making it transversal for any transport sector. Our adapted process starts with task analysis for Human Error (HE)

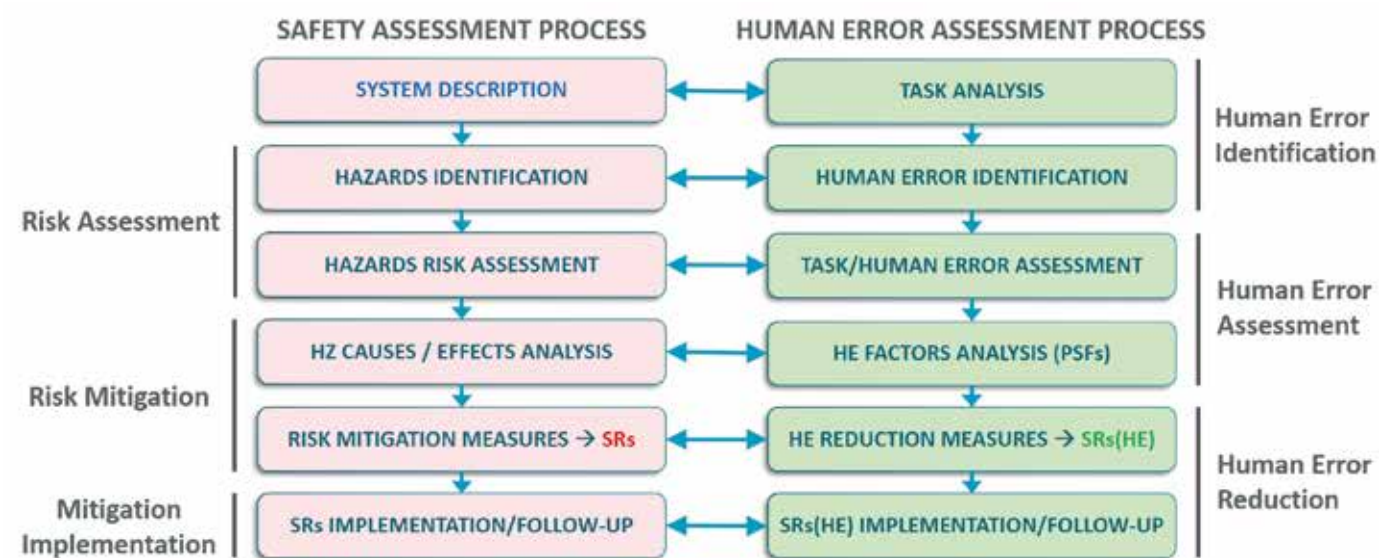
identification. A specifically designed parameter classification indicates the tasks' potential for error, and the link to the safety analysis determines the errors' contribution to hazards and their criticality. Finally, our HE assessment uses an adapted list of generic Performance Shaping Factors (PSF), determining and assessing what affects human performance. The combination of task potential for error, error criticality and PSFs establishes priorities for a custom designed HE reduction technique: FARHRA (Feasible Action Rules for Human Reliability Assessment). It provides a broad set of generic

measures, aligned with the typical system view used in safety assessment.

The main achievements and innovations obtained through this project are:

- Definition of a global methodology integrating known HF techniques into a standard safety assessment, in a manner easily applicable by safety practitioners.
- Development of new techniques, like FARHRA, for a better integration, also offering and customizing tools such as HAZOP sessions, interviews, surveys or questionnaires, for optimized results.

The product will enhance system design deriving specific requirements to improve human performance, increasing safety levels and adding value and recognition to the human role.



HAZERTEC, innovation applied to safety in railway structures

Hammer has had the support of the CDTI as well as the Fundación Caminos de Hierro and ANCO Engineers Inc. Four situations have been identified in which this system represents significant added value:

- Dynamic load testing for commissioning of new structures in accordance with standards.
- Specific inspections of structures that are in service when damage has been detected and/or on lines on which a dynamic load increase is expected.
- Analysis of the degree of deterioration of a structure over time, applicable to preventive maintenance of structures.
- R&D&I activities and its application in predictive maintenance

INSE RAIL AND TELICE HAVE DEVELOPED THE HAMMER PROJECT, A SYSTEM FOR MONITORING THE STRUCTURAL INTEGRITY OF RAILWAY INFRASTRUCTURE BY ANALYZING ITS DYNAMIC RESPONSE.

The spectrum of target clients is made up of infrastructure management companies, construction companies, and railway operators that are also responsible for maintaining the network, as well as companies specializing in asset management. The project culminated with the tests carried out in León (02/18), under the institutional auspices of ADIF, whose permission to access to the two structures that were tested was key. The tests were performed under very adverse condi-

tions: the test of the first bridge coincided with the largest snowfall of the winter, and the second was performed at night under heavy rainfall. The results obtained have validated the industrial technology developed and the method designed to characterize the condition of railway structures. The next step is to expand the functions of the system and begin marketing it through HAMERTEC, after the process of patenting the product has been initiated.

Regiotram and province of Utrecht Trusts and invest on digital transformation

This year, Province of Utrecht and Regiotram have innovated in their way of getting digital technologies and services for rolling stock maintenance and operations excellence. With the clear target of minimizing the technical and financial risks involved in any kind of technology. Province of Utrecht has trusted in NEM Solutions as Long-Term Digital Services Partner.

Domain knowledge is the new data

This is a clear example of how this digital era is changing the rules of the game. The reaction time is essential to take advantage of the existing business opportunities and to ensure the medium and long term competitiveness. The main goal of this project is to transform Data into Business Knowledge. The only way of getting closer to the goal is by obtaining high quality data acquisition of the key rolling stock assets. Definitely, to move from a Preventive to a Predictive Maintenance scenario by knowledge generation.

10-YEARS AGREEMENT TO TRANSFORM DATA INTO BUSINESS KNOWLEDGE. THROUGH A.U.R.A. TECHNOLOGY, PREDICTIVE ANALYTICS AND RAILWAY EXPERTISE OF NEM SOLUTIONS.

Gain savings, gain safety

NEM Solutions is responsible of implementing all the required technologies to generate the high added value outcome to meet the project goal. A.U.R.A. technology will be combined with predictive data analytics excellence and railway expertise to generate millionaire life cycle cost savings.

While ensuring the highest reliability, availability and safety conditions during rolling stock assets operation. The ultimate goal is to minimize the life cycle cost of rolling stock assets.

Analytic Excellence: Data into smart decisions

This project includes a solid digital transformation based on a clear digital strategy, culture and a strong people commitment.

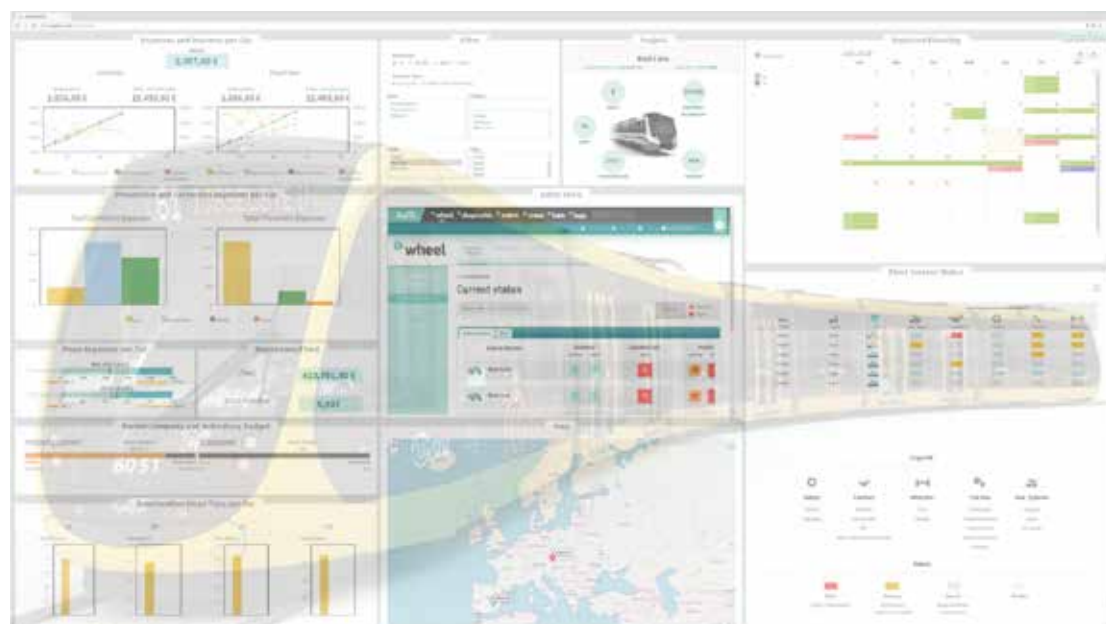
Further more, business assessment services are guaranteed to guide Re-

giotram during the complete transformation process.

Some of the technologies that are being implemented are:

- A.U.R.A. Diagnostic as the digital platform for a Remote and Real Time Analytics for reliable assets Health Diagnostics and Prognostics.
- Together with Automatic Wheel Monitoring System, installed inside the new maintenance workshop to ensure high quality wheel profile measurements.
- A.U.R.A. wheel as the digital platform for wheel maintenance optimization and life extension among other technologies.

NEM Solutions will keep working on its worldwide used technology and methodology to optimize rolling stock maintenance plans and costs while ensuring a safe and reliable performance.



SIDERA: innovative integral management for railway tunnels



SIDERA is a platform for monitoring and control of equipment with an incident management tool, that allows the remote control of safety elements: Emergency lighting system, Electric power system, Radiocommunication system, water pump level at tanks, CO level alarm at the Transformation Substation.

It allows to define alarm activation thresholds and the management of activation and deactivation of equipment for its maintenance.

SIDERA has resulted in a substantial improvement for the reduction of maintenance costs, and in the improvement of service levels. It controls all installed equipment, manages

SIDERA, THE INNOVATIVE INTEGRAL MANAGEMENT FOR SICE RAILWAY TUNNELS, HAS BEEN IMPLEMENTED IN THE TUNNELS MANAGED BY ADIF OF THE ATLANTIC RAILWAY AXIS, WHICH HAS 24 VIADUCTS AND 20 TUNNELS TOTALING 21.7 KM OF TUNNEL OUT OF 94.5 KM

events, alarms and data collection ensuring a quick response to incidents from the operations control center allowing, therefore:

- Improved user safety in a tunnel
- Reduction of operation and maintenance costs
- Smart incident management and equipment maintenance
- Improvement of the reliability of systems and infrastructures

• Efficient control of the equipment of the integrated systems
The most outstanding characteristics is the centralized integral management through its unified graphical HMI. Its expandable modular architecture facilitates the incorporation of technological advances and new functionalities, as well as the integration of third-party tools.

More efficiency and new capabilities for control centres in transport sector

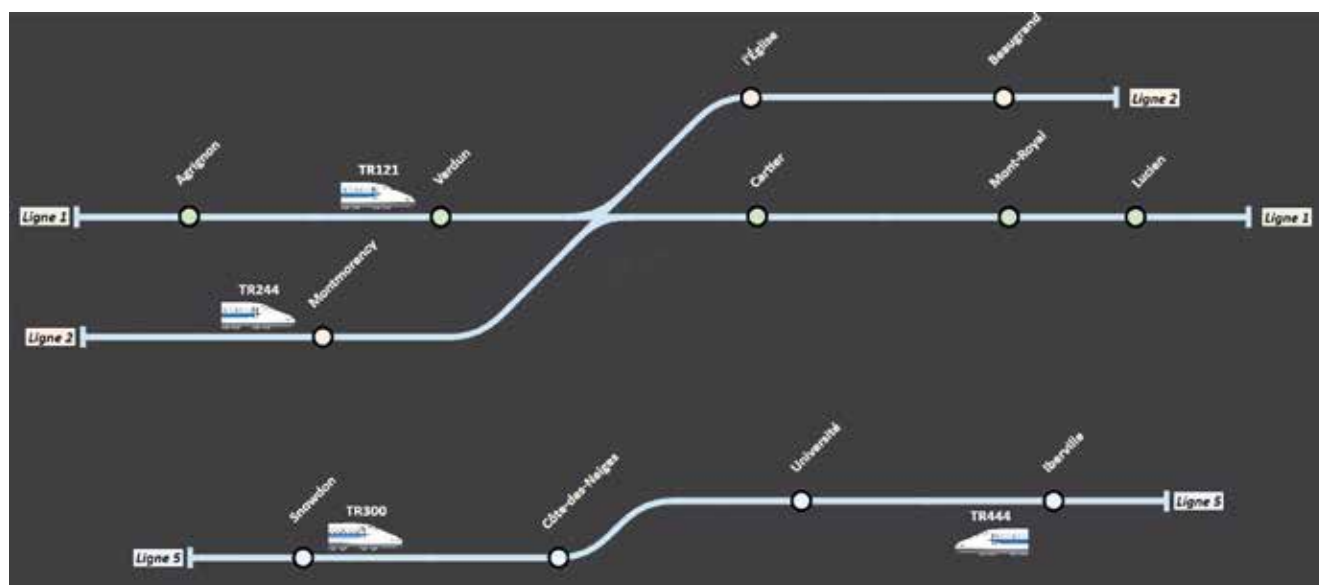
The new version of IC&C consists of a computer system that integrates several voice, data and multimedia communications among different network (digital radio systems as TETRA, DMR or LTE, analogic radio, telephony, cellular mobile systems, etc.), thus enabling swift and effective communications and information management. The system can be fully customized to meet the needs of each project thanks to its modular and scalable structure, allowing to configure and gradually expand the system by means of new software licenses and operator workstations. Besides, it presents an active-active redundancy approach both in hardware and services (calls, messages, contacts, alarms, and recordings), and offers an intuitive working desk and specifically adapted to the operation of metros, railways, LRT or buses. Functionally, it supports a wide range of standard functions: individual call, group call, messages, multi-select, broadcasting, listen-in, mute, terminal localization, supervision of operators... and, on the other

TELTRONIC HAS DEVELOPED A NEW EVOLUTION OF ITS INTEGRATED COMMAND & CONTROL, A TOOL THAT HAS BEEN ESPECIALLY DESIGNED FOR CRITICAL ENVIRONMENTS, SUCH AS TRANSPORT, WHERE SYSTEM RELIABILITY AND FLEXIBILITY ARE ESSENTIAL.



side, the transport module RDM (Rail Dispatcher Module), permits an easy interaction with other sub-systems as Public Address systems, Intercoms, Passenger Information Systems, Video surveillance or rail signalling. Finally, the new release has stressed the user interface through the

new Dynamic Map. It is a panel that shows a schematic view of the transportation line, including track-side, stations, roads or other elements like depots, configuring the line profile. The representation can be complete or be split in smaller parts in separated panels visible to an operator.



GLIS - Guide Light Intelligent System Intelligent escape route guiding system

Every day, large numbers of people move about enclosed areas, such as office buildings, shopping centres, stadia, leisure facilities, etc., where evacuation of occupants may prove really challenging in the event of an emergency situation.

In Spain, emergency evacuation plans have been implemented in all the buildings the public have access to, such as commercial premises, offices, hotels, restaurants, and transportation facilities. They have been put in place in order to comply with the requirements of the current legislation and applicable building standards. These emergency plans are based on static signage systems, but this type of signage has several drawbacks.

Many people may fail to detect and see static signs in emergency situations, due to the stress they are experiencing during evacuation, congestion on escape routes or the presence of smoke.

Moreover, when an incident occurs on an evacuation route and the exit is no longer available, static signage systems are not effective as an aid to wayfinding, and they may even have

SYSTEM CONCEIVED AND DEVELOPED BY AUXITEC TÉCNICA Y CONTROL S.A. (TPF GETINSA EUROESTUDIOS GROUP) IN COLLABORATION WITH THE SPANISH INDUSTRIAL TECHNOLOGY DEVELOPMENT CENTRE (CDTI).

adverse effects in such situations. The system conceived and developed by Auxitec (TPF GETINSA EUROESTUDIOS Group) does not propose any alterations to the legal framework or safety regulations in force. It offers a solution that, without being invasive over the existing systems (fire protection, fire alarms, control centre...), allows for an effective emergency evacuation. The GLIS (Guide Light Intelligent System) is able to define and signal, in real time, the shorter and/or safer evacuation routes during an emergency by using its own algorithms. When calculating the best evacuation routes, the system takes into account factors such as the kind of dangerous situation, the total amount and distribution of people in the facility, available and non-available exits, the topology of the facility and people density in conflict areas that are potentially dangerous due to risks of congestion. The GLIS system constantly monitors

the data obtained during an emergency and recalculates evacuation routes, if required. Evacuation routes are signalled using LED light strips so that people can easily locate available evacuation exits. LED devices are also used to guide emergency response teams to the incident location as quickly as possible.

The Department of Automation, Electronics and Electrical Engineering and Industrial Computer Science at the Polytechnic University of Madrid collaborated with Auxitec (TPF GETINSA EUROESTUDIOS Group) in the development of the GLIS system. Furthermore, the project received funding from the Spanish Center for the Development of Industrial Technology (CDTI) and the European Regional Development Fund (ERDF) under the Madrid ERDF Operation Plan 2007-2013

For further information on the GLIS system, please, get contact us at: auxitec@auxitec.es

MEMBERS DIRECTORY

INFRASTRUCTURE

Engineering and consultancy

- AKKA Technologies Spain
- Aquafrisch, S.L.
- Ardanuy Ingeniería, S.A.
- CAF Power & Automation
- CAF Turnkey & Engineering
- Colway Ferroviaria, S.L.
- Creativitic Innova, S.L.
- Gantrex S.A.
- Idom
- Ineco
- Inserail, S.L.
- MB Sistemas, S.Coop.
- NEM Solutions, S.L.
- Newtek Sólidos, S.L.
- LADICIM
- Limmat M&M S.L.
- Segula
- Sener Ingeniería y Sistemas, S.A.
- Tecnalia
- Tecnival Infraestructuras
- Teltronic, S.A.U.
- TPF Getinsa-Euroestudios
- Tria Ingeniería y Técnica del Transporte
- Typsa
- Vicomtech

Civil engineering construction

- Azvi
- COMSA
- Instalaciones Inabensa, S.A.
- Inserail, S.L.
- Parrós Obras, S.L.
- PRECON - Prefabricaciones y Contratas, S.A.U.
- Pretensados del Norte

Electrification

- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Arteche
- Idom
- Ineco
- Ingeteam Power Technology, S.A.
- Inserail, S.L.
- La Farga Yourcoopersolutions, S.A.
- Luznor
- Parrós Obras, S.L.
- SEMI, S.A.
- Telice
- TPF Getinsa-Euroestudios
- Typsa

Fixed material: components and equipment

- Alstom Transporte, S.A.
- Amurrio Ferrocarriles y Equipos, S.A.
- Aquafrisch, S.L.
- Arteche
- Duro Felguera Rail, S.A.U.
- Gantrex S.A.
- HICASA - Hierros y Carbones, S.A.
- Idom
- Ikusi
- Ineco
- Inserail, S.L.
- ITK Ingeniería, S.A.
- JEZ Sistemas Ferroviarios, S.L.
- LADICIM
- Newtek Sólidos, S.L.
- Parrós Obras, S.L.
- Siemens Rail Automation, S.A.U.
- Talleres Alegría, S.A.
- Thales España GRP, S.A.U.
- Valdepinto, S.L.

Security

- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- DSAF. Dinámicas de Seguridad
- Ecocomputer S.L.
- Idom
- Ikusi
- Implaser 99, S.L.L.
- Ineco
- SICE
- Siemens Rail Automation, S.A.U.
- Telice
- Tecnival Infraestructuras
- Thales España GRP, S.A.U.

Signaling and traffic control

- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Bombardier España
- Cables y Comunicaciones Zaragoza S.A.
- CAF Signalling
- DSAF. Dinámicas de Seguridad
- GMV Sistemas S.A.U.
- Idom
- Ikusi
- Implaser 99, S.L.L.
- Indra Sistemas, S.A.
- Ineco
- Luznor

- P4Q Electronics, S.L.
- SEMI, S.A.
- SICE
- Siemens Rail Automation, S.A.U.
- Telice
- Tecnalia
- Tecnival Infraestructuras
- Teltronic, S.A.U.
- Thales España GRP, S.A.U.
- TPF Getinsa-Euroestudios
- Typsa

Maintenance

- Alstom Transporte, S.A.
- Amurrio Ferrocarriles y Equipos, S.A.
- Azvi
- COMSA
- Danobat
- Duro Felguera Rail, S.A.U.
- Idom
- Ikusi
- Ineco
- Inserail, S.L.
- Instalaciones Inabensa
- LADICIM
- Parrós Obras, S.L.
- Siemens Rail Automation, S.A.U.
- Telice
- Thales España GRP, S.A.U.

Stations

- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Idom
- Ikusi
- Ineco
- Luznor
- Parrós Obras, S.L.
- Thales España GRP, S.A.U.
- Typsa

INFORMATION AND DATA SYSTEMS

Systems and equipment for collection and ticketing

- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Calmell Group
- Ecocomputer
- Idom
- Ikusi
- Indra Sistemas, S.A.
- SICE
- Thales España GRP, S.A.U.

Communications, information systems and passenger information equipment

- Alstom Transporte, S.A.
- Aoife Solutions, S.L.
- Ardanuy Ingeniería, S.A.
- Cables de comunicaciones Zaragoza, S.L.
- CAF Power & Automation
- Ecocomputer
- Icon Sistemas de Información y Datos
- Idom
- Ikusi
- Indra
- Ineco
- P4Q Electronics, S.L.
- SICE
- Siemens Rail Automation, S.A.U.
- Tecnalia
- Telice, S.A.
- Teltronic, S.A.U.
- Thales España GRP, S.A.U.
- TPF Getinsa-Euroestudios
- Typsa
- Vicomtech

ROLLING STOCK

Passenger car manufacturers

- Alstom Transporte, S.A.
- Bombardier España
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Cetest
- Inserail, S.L.
- Patentes Talgo, S.L.
- Stadler Rail Valencia S.A.U.
- Zfoam, S.L.

Manufacturers of freight wagons

- Alstom Transporte, S.A.
- Bombardier España
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Talleres Alegría, S.A.
- Stadler Rail Valencia S.A.U.

Locomotive manufacturers

- Alstom Transporte, S.A.
- Bombardier España
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.

- Patentes Talgo, S.L.
- Stadler Rail Valencia S.A.U.

EQUIPMENT AND COMPONENTS ROLLING STOCK

Traction and control systems

- Alstom Transporte, S.A.
- CAF Power & Automation
- Cetest
- CITEF
- Ingeteam Power Technology, S.A.
- P4Q Electronics, S.L.
- Patentes Talgo, S.L.
- Tecnalia

Components

- Albatros, S.L.
- AL-KO Record
- Alstom Transporte, S.A.
- Arteche (Electrotécnica Arteche Smartgrid, S.L.)
- CAF Power & Automation
- Cetest
- Convenzar
- Flexix
- Fundiciones Garbi, S.A.
- Funor, S.A.
- Gamarra, S.A.
- Hispacold
- Ikusi
- Indra
- Ingeteam Power Technology, S.A.
- Metalocaucho, S.L.
- MGN Transformaciones del Caucho, S.A.
- P4Q Electronics, S.L.
- Siemens Rail Automation, S.A.U.
- Tecnalia
- Teknorail Systems, S.A.
- Valdepinto, S.L.

Equipment and machinery for the manufacture of rolling stock

- Aquafrisch, S.L.
- Cetest
- Danobat
- MB Sistemas, S.Coop.

Interiors

- Alstom Transporte, S.A.
- Colway Ferroviaria, S.L.
- Convenzar
- Idom

- Kelox, S.A.
- Teknorail Systems, S.A.
- Valdepinto, S.L.
- Zfoam, S.L.

Security

- Albatros, S.L.
- Alstom Transporte, S.A.
- Ardanuy Ingeniería, S.A.
- Cetest
- DSAF. Dinámicas de Seguridad
- Idom
- Ikusi
- Implaser 99, S.L.L.
- Indra
- Lander Simulation & Training Solutions, S.A.
- Luznor
- Siemens Rail Automation, S.A.U.
- Tecnatom
- Thales España GRP, S.A.U.

Maintenance

- Albatros, S.L.
- Alstom Transporte, S.A.
- Aquafrisch, S.L.
- CAF - Construcciones y Auxiliar de Ferrocarriles, S.A.
- Cetest
- Danobat
- Goratu
- Ikusi
- Ingeteam Power Technology, S.A.
- Kelox, S.A.
- Luznor
- Metalocaucho, S.L.
- NEM Solutions, S.L.
- Newtek Sólidos, S.L.
- Patentes Talgo, S.L.
- Siemens Rail Automation, S.A.U.
- Talleres Alegría, S.A.
- Tecnalia
- Teknorail Systems, S.A.
- Teltronic, S.A.U.
- Stadler Rail Valencia S.A.U.

Quality control, inspection and certification

- Tecnatom

OTROS

- Encaix Comunicació Visual, S.L.
- Lamaignere Cargo, S.L.
- Bigda Solutions (Meteo for Energy, S.L.)



AKKA TECHNOLOGIES SPAIN, S.L.U.

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Akka Technologies Spain develops engineering and consulting projects with close to 400 consultants assigned to the main technological sectors. In the railway sector, they carry out projects related to rolling stock, track infrastructure and signalling. With regard to operational railway safety, the firm develops Certification activities, carrying out independent safety assessments (ISA) on multiple systems.



ALBATROS, S.L.U.

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Albatros is a Spanish company, with trademark SEPSA and subsidiary of the German group Schaltbau, specialized in the design, manufacture and marketing of equipment for trains, metros and trams. It consists of two engineering units: Power electronics (design and manufacture of auxiliary power converters and battery chargers) and On-board Systems (design and manufacture of PACIS, communication systems, control systems and other integrated systems). SEPSA is a leader in providing of auxiliary components for trains and is one of the first supply companies in such competitive markets as Europe, the United States and Latin America. The headquarters are located in Spain, where a powerful engineering department is located. In addition, Albatros has factories in Pinto (Spain), New York (USA) and Sao Paulo (Brazil).



ALSTOM TRANSPORTE, S.A.

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As a promoter of sustainable mobility, Alstom Transport is the only railway manufacturer present in the full spectrum of transport systems, equipment and services. The company offers a complete range of high performance products: rolling stock, signalling, maintenance and modernisation, infrastructure and integrated solutions. In Spain, Alstom Transport employs around 2000 people in 19 working sites, has a manufacturing site in Barcelona and develops R&D programmes both for rolling stock and railway signalling and safety projects. The technological laboratory located in Madrid has become a benchmark for signalling projects throughout the world.



AMURRIO FERROCARRIL Y EQUIPOS, S.A.

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Amurrio Ferrocarril y Equipos, S.A. is one of the international market leaders in the design, production and installation of railway materials. Our rolling stock interchanges and crossings are installed in high-speed rail lines, underground lines, tram lines, and conventional railways throughout Europe, Asia, America and Africa.

In the area of metal foundry, we have the experience, the knowledge and the people to produce, process and mechanize machine tool parts and sets of great technical complexity in carbon steel manganese steel and other steel alloys.



AOIFE SOLUTIONS, S.L (GALGUS)

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The software developed by Galgus, whose trading name is CHT (Cognitive Hotspot Technology), may be installed in any WiFi access point, irrespective of the manufacturer and its technology. Upon installation of the software in a WiFi access point, this will become "smart", thus being capable of easuring what is occurring in the environment and the WiFi network itself, of sharing this information with other CHT access points and making decisions in tandem to optimise the operational functionality of the WiFi network. Measurements taken on trains display that the use of CHT technology in WiFi access points improves the performance of a WiFi network by between 4 and 8



times.

AQUAFRISCH, S.L.

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Aquafrisch is a service oriented company. Our task is to provide our customers needs with reliable results.

Aquafrisch provides a wide offer in equipment and services in both working fields for the company:

1. Aquafrisch Rail: solutions for railway equipment in depots and workshops.
2. Aquafrisch Agua: solutions for water treatment both in consumption and waste waters.



ArcelorMittal

ARCELOMITTAL ESPAÑA, S.A.

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► rails.specialsections@arcelormittal.com
► www.rails.arcelormittal.com

ArcelorMittal is the world's leading steel and mining company and it is part of a small group of rail manufactures whose production has developed notably in the specialized high-speed, heavy-haul, metro, conventional lines and other applications are light rail and tram in the different qualities of normal carbon steel, micro alloyed and head hardened rails.

ArcelorMittal quality has been recognized by customers around the world, from Europe through Asia to Oceania, America and Africa.

Next time you travel by train, no matter the continent where you are, you may be doing it on rails manufactured by ArcelorMittal.



ARDANUY INGENIERÍA, S.A.

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Ardanuy is a consultancy company that specializes in studies, designs, works management and technical consultancy pertaining to Rail, Metro, Tram and Cable Transport.

The company was founded in December 1992 and is made up of a team of over 100 Engineers and Architects. Other experts also act as consultants to Ardanuy staff on specific projects.

In Spain, Ardanuy carries out work from offices in Madrid, Barcelona, Valencia, Seville and Tenerife. It also has offices in Lithuania, Poland, India, Colombia, Algeria and USA.

Ardanuy has always had a marked international vocation. Currently over 90% of new contracts are won on the international market, in Western Europe: United Kingdom, Ireland and France; Central and Eastern Europe: Poland, Bulgaria, Latvia, Lithuania; America: Bolivia, Chile, Colombia, Mexico, Peru, USA; Africa: Morocco, Mozambique, Algeria, Egypt, South Africa; and Asia: India, Vietnam, Kazakhstan.



ARTECHE (ELECTROTÉCNICA ARTECHE SMARTGRID, S.L.)

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Arteche Group's business is focused on providing equipment, applications and solutions for the electricity and railway sector worldwide.

In power generation, transmission, distribution, industry, and railway technologies, the group has become a key player in the search for answers to new challenges.

A position maintained by a deep knowledge of the different international electricity systems, efficient client-oriented organization and remarkable investment in research and development.

This is shown by over 50% increase in the brand references in the past five years. Arteche's decisions over the years made our group a symbol of reliability, quality and trust, both in solutions and in corporate relations.

Corporate alliances have taken a key role in Arteches's history, becoming an asset which has contributed to our international growth and to the development of innovative solutions.



AZVI

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Azvi is a hundred-year-old Company specialised in Civil Works whose origins are in railways, forming part of the history and evolution of the railways and its infrastructures in Spain and abroad. Throughout these years, Azvi has participated in numerous construction, rehabilitation, conservation and maintenance projects over more than 1,000 kilometres of track, of which almost 450 km have been High-Speed Rail built within the last 25 years.

Azvi also has a large and modern machinery park which allows the company to carry out works with its own machines and a Logistics Centre equipped with modern facilities and state of the art resources in order to centralize a variety of support services to railway activity, such as MachineryPark, materials, maintenance, checking and repairing shops. Research and Development is also an important issue for Azvi.

Through its own R&D department, Azvi invests in railway research and development, in collaboration with various public and private entities and investigation groups.



BIGDA SOLUTIONS (METEO FOR ENERGY S.L.)

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The company undertakes development projects involving Big Data and artificial Intelligence technology to optimise

companies' productive processes and energy consumption.

Amongst other endeavours, they carry out advanced analytical projects, data analysis techniques, to define scenarios in real time and predict future behavioural trends. On the other hand, through machine learning techniques, they make predictions, based on a set of data that is fed back and improved with new information.

BOMBARDIER

BOMBARDIER ESPAÑA

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Bombardier Transportation, a global leader in rail technology, offers the broadest portfolio in the rail industry.

Bombardier Transportation Spain is one of the leading exporters of the Spanish railway industry, employing more than 750 people in its plants and offices in Trápaga (Biscay), San Sebastian de los Reyes and Alcobendas (Madrid), Madrid and Barcelona, and taking part in some of the major railway projects in the country. Its Propulsion Systems plant located in Trápaga (Biscay) and its Centre of Excellence in Rail Signalling Engineering located in San Sebastian de los Reyes (Madrid) are world top technological centres, leading the requests for Bombardier's propulsion and signalling systems for Spain and for the rest of the world. Exports represent already more than 85% of its activity.



CABLES DE COMUNICACIONES ZARAGOZA

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Founded in 1971, Cables de Comunicaciones has been steadily building its re-

putation as a respected business in the field of communications cables. Cables de Comunicaciones has cemented its position and its products are now used in over 50 countries around the world.

The company has a wide range of products that are certified according to the standards of the leading telecomm and railway operators in the majority of countries in Europe. It is dedicated to designing and developing excellent telecommunications, signalling, instrumentation, data and fibre optic cables.



CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES, S.A.

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CAF is a firm focused on investigation, development, design, production and maintenance of Rolling stocks for the railway industry. Our product range include from High Speed, to regional and suburban trains, articulated units, underground trains, LRVs, light underground trains and locomotives. Maintenance of the whole range. It boasts production premises throughout Spain (Beasain, Irun, Zaragoza, Castejón and Linares), as well as in the USA (Elmira NY), France (Bagnères de Bigorre), Mexico (Mexico Df) and Brazil (Sao Paulo) and Rail Technological Centres in Beasain and Zaragoza. CAF's projects are distributed in over 25 countries around the world in the five continents.



CAF POWER & AUTOMATION

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CAF P&A is a global manufacturer of electric power solutions as well as information and communications systems for the rail industry.

CAF P&A have equipped more than 5,000 vehicles world wide including, metros, light rail, locomotives and high-speed trains. One of the main strategic lines is the development of its own technology. To do so, as a major asset, CAF P&A has a team of experienced, competent and dynamic specialists. CAF P&A develops, manufactures and deliver high reliability solutions adapted to each and every client's specific needs in compliance with railway standards.



CAF SIGNALLING

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► www.cabsignalling.com

CAF Signalling, the technological subsidiary of the CAF Group, provides rail traffic signalling, both in Spain and abroad. As such, it offers railway signalling solutions and remote control for Railway infrastructures. CAF Signalling, boats the Company's own in-house engineering and expertise to take on "turn-key" railway signalling projects with recognition from several Railway Administrations in Spain and other countries in Europe, America, Africa, Middle East and Asia.



CAF TURNKEY & ENGINEERING

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► www.cafte.com

CAF Turnkey & Engineering was created in 2007 with its head office is 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.



CALMELL GROUP

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Montcada i Reixac (BARCELONA)

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► F: +34 93 564 58 22

► calmell@calmell.net

► www.calmell.com

The first company of the group, Calmell, S.A. was founded in 1970, focusing its activity on the manufacture or graphic products. Currently, 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.



CETEST

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Test and analysis services for:

■ Design verification and validation.

■ Full homologation of new products and vehicles.

■ Failure analysis and optimization.

Fully accredited test lab with more than 40

years of experience in railway testing. Test services cover the following areas:

■ Structural components.

■ Running gear.

■ Suspension systems.

■ Vehicle dynamics.

■ Noise and vibrations.

■ Aerodynamics.

■ EMC and energy consumption.

■ Mechatronics.



■ Special instrumentation (Instrumented wheelsets, instrumented pantograph).

CITEF (FUNDACIÓN PARA EL FOMENTO DE LA INNOVACIÓN INDUSTRIAL)

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Tecnalia is a leading research and technological development centre in Europe. They offer a vision of innovation, developing alongside companies solutions that provide value through technology and competitive solutions that transform and grow businesses, improving the future of companies and society.



COLWAY FERROVIARIA, S.L.

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Colway Ferroviaria, S.L., company belonging to the COLWAY Group, specializes in the design, engineering, manufacture, supply, installation and commissioning of turnkey railway vehicle interiors. Through the integrated management of modular supplies, based on experience, knowledge, research and innovation, the company achieves the satisfaction of the needs and expectations of its customers: railway man-

ufacturers and public administrations. Colway capabilities include Modular System solutions for Rail Interiors as Toilet Modules, Front hoods, saloons, walls, Buffet, Restaurant areas, vestibules.



COMSA CORPORACIÓN

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COMSA is the company of COMSA Corporación specialised in the construction of railway infrastructures. Founded in 1891, the company provides a comprehensive service in the field of railway construction and maintenance, electrification, and control and communication systems of high speed rails, conventional rails, metros and tramways. In this business activity, it is leader in Spain, where has been involved in the construction of all high speed lines, and has permanent operations in Argentina, Brazil, Lithuania, Mexico, Poland, Portugal and Turkey. It has also taken part in a large number of projects in other markets such as Italy, the Philippines, Taiwan, Malaysia, India, etc. This extensive experience has been the key for its consolidation in the railway sector and has enabled it to become the leader in the railway construction industry.



CONVERZAR

► Pol.Ind.Malpica C/F Oeste Grupo
Gregorio Quejido, Nave 64 CP
50016 – (ZARAGOZA)

► P: +34 976 138 097

► sergio.boillos@converzar.com

► www.converzar.com

Since 1975, Converzar is a company dedicated to distribution and converting of adhesive tapes, abrasives and liquid adhesives.

Experience, quality, flexibility, agility and commitment to people and the environment, are values that best identify us. Our principal lines of business are designed to provide

the best solutions to specific needs of our customers:

1. DISTRIBUTORS of adhesive tapes, liquid adhesives and abrasives. We have the Preferred Converter of 3M, we also work with leading brands in the adhesives market, which guarantees the quality of our products and makes us reliable suppliers.

2. CONVERTING AND MANUFACTURE of adhesive materials. Satisfying the requirements of our customers, Convezar offers comprehensive solutions from design, development, prototypes and series phases, to the application phase of our product, also offering automation options.

We have a large parquet of last generation machinery of: Laminators, Lathes, Cutters Stamping machines, CNC and Laser cutting and engraving.



CREATIVITIC INNOVA, S.L.

► Huesca, 9 1C 26002 Logroño (LA RIOJA) (Delegación Norte: Lehendakari, 11 1º Dpto 18 4014 Bilbao (VIZCAYA))

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► jrlopez@creativitic.es

► www.creativitic.es

Consulting, training and research and the development of products, systems and services based on emerging and innovative technologies using augmented, virtual and mixed reality, integrated with IoT and AI systems for technical support in industrial solutions...



DANOBAT

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► danobat@danobat.com

► www.danobat.com

Danobat Railways business unit focuses its activity in the supply of turnkey solutions for the manufacturing and maintenance of railways rolling stock, incorporating own products of leading technology, together with those manufac-

tured by specialized companies. It gathers extensive experience and qualification in the rendering of services such as engineering services, equipment integration, complex project management, and collaboration with the customer all along the life of the project. Danobat has a strong international presence and references in the most relevant customers.



DSAF – DINÁMICAS DE SEGURIDAD, S.L.

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Polígono Industrial de Gojain

01170 Legutiano (ÁLAVA)

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► www.dsaf.es

DSAF is a company structure devoted to People's Movement Safety. It is committed to providing new technologies applied to design and project implementation, as well as initiatives that guarantee an approved evacuation safety level in this generalized risk society.

Emergency signalling is DSAF's main application area; it develops photoluminescent, electroluminescent and LED signalling systems for people evacuation in risk situations and environments: tunnel evacuation safety, vessel evacuation safety, building evacuation safety...

DSAF safety applications are developed in three big areas: tunnel safety (road / railway), safety in vessels, and buildings.



DURO FELGUERA RAIL, S.A.U.

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33600 Mieres (ASTURIAS)

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► F: +34 985 45 61 64

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► www.durofelguera.com

DF Rail is a Spanish company specialized at the design, manufacturing and supply of turnout systems and components for Metro, Conventional, Heavy Haul or High

Speed Lines. Turnouts, single and double crossovers, diamond crossings, single and double slip crossings, single and double junctions, switch expansion joints, ..., on wooden or concrete sleepers; for ballasted or unballasted tracks; for single or combined gauges; with monobloc Mn steel crossings or with swing nose crossings; insulated glued joints; transition rails.



ECOCOMPUTER S.L.

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► F: 34 985 56 83 17

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Ecocomputer S.L. is a technology firm based on North Spain (Asturias and Cantabria) and focused on the design, development and implementation of IT solutions on the railways industry (ie: ticketing, booking, passenger information system) and access control and time&attendance business. Founded on 1999, it holds a wide portfolio of own products as a result of years of evolution and adaptation to customer needs. Ecocomputer provides as well onsite IT maintenance services for the railways operators and administrator infrastructure companies (Railway Control and Regulation Centres, security infrastructure, IT equipment).



ELEKTRA-GRUPO ELEKTRA, S.A.

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Grupo Elektra is a market leader in the field of electrical and electronic equipment distribution for manufacturers of rolling stock, maintenance and railway equipment manufacturers.

Being the leading company in the railway sector in the supply of electrical equip-

ment. Your solution provider in electrical products for railway, with specific technical support. Elektra Group is composed of an extensive Spanish national network and has companies in Romania, India and USA.



FLEXIX

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Zamudio (VIZCAYA)

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► F: +34 944 977 190

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Flexix develops, manufactures and sell worldwide injection and extrusion rubber parts, rubber-metal, rubber-plastic and assemblies.

We belong to Kächele-Flexix Group, with plants near Stuttgart and Munich (Germany), Zamudio (Spain) and a logistic warehouse in Houston (USA).

Our products for the railway sector, are mainly for infrastructures, absorption of vibrations under track, tie pads for sleepers, with different stiffness, new developments, materials, competitiveness, non-conductivity (or yes, if necessary), non-harmful gases.

Type of parts Flexix produces: Ducts, bellows, tubes, silentblocks, joints, bumpers, axles, links, valves, bearings.

Mixtures: nr, sbr, epdm, cr, nbr/hnbr, eco, aem, acm, vmq/silicone, fkm/fpm.



FUNDICIONES GARBI, S.A.

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► www.fundicionesgarbi.es

Founded back in 1972, Fundiciones Garbi has evolved from a traditional foundry to a Global Service Company for industry.

We offer a full catalogue of services starting from the casting or other materials till delivery of "ready to use" parts or assembly

sets. With this aim, we have developed an organization oriented towards solid and competitive processes, ensuring quality from design phase using APQP tools. Well aware of customer satisfaction, we offer to our clients additional global services including a full range of heat treatments, machining, product inspection and testing (NDT's, etc), protection and finishing surface treatment (Painting, Metallization, Others...), including final assembly of different parts. For the Railway industry we are specialized on production of rolling stock material.



FUNOR, S.A.

► Pol. Ind. de Villalonquejar

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(BURGOS)

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Castings in carbon steel, alloy steel and stainless steel.

Our products:

■ Steel casting.

■ Raw castings or fully machined.

Examples:

■ Bogie components.

■ Pivots.

■ Motor housings.

■ Pressure rings.

■ Axle boxes.

■ Links.



GAMARRA, S.A.

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01013 Vitoria (ÁLAVA)

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► F: +34 945 27 49 48

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Gamarra, S.A. at a glance: Spanish steel foundry -located at Vitoria Gasteiz- annual production: 4,000 tons - customers: European State Railways, - producers of rolling stock and their subsuppliers - as

foundry and supplier homologated by DB AG (HPQ), ÖBB, SBB, SNCF (AFQ) (extract) as well as according to DIN EN ISO 9001: 2000 + DIN 6700 - 2. Products: brake discs, brake block shoe holders, buffers, spigots and essential steel castings for bogies.



GANTREX, S.A.

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Gantrex Spain, S.A. is the global market leader in specialty rail tracks fixation including design, production, supply of goods and installation of turnkey contracts. Rail fixation at train workshops, embedded rails accesses for Ports or logistic terminals and private rail installations together with other Subway's and Tram's required installations are some of Gantrex Spain's main activities.

Products:

■ All sections of rails

■ Metallic railway sleepers

■ Rail fixing Clips

■ Rubber pads for rails

■ Steel columns for trains maintenance

■ Embedded rail fixation systems (recycled rubber)

■ Embedded rail fixation systems (polyurethane)

■ Hydraulic buffers



GMV SISTEMAS, S.A.U.

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► F: +34 983 54 65 53

► ahernandez@gmv.com

► aags@gmv.com

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Since 1994 GMV provides Intelligent Transport Systems, offering turnkey solutions and specific products. GMV develops applications adapted to sector needs, including satellite navigation, mobile communications, passenger information, fare collection systems and monitoring-and-control centers. GMV's railway portfolio

includes fleet management system, SAE-R®, providing operators with an all-in system for planning and management, and other products like CCTV, PA-Intercomm and Passengers Video Information, as well as electronic fare collection systems for railway sector.



GORATU

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- http://www.goratu.com

Under the trademark of the prestigious market leader GEMINIS, Goratu develops horizontal and multiprocess lathes of the highest technology.

We offer customized solutions for high specialization technologies.

60 years of experience and specialized knowledge in the Railway Sector have let us to the design and manufacture of lathes for manufacture and maintenance of axles, wheels and wheelsets.



HICASA - HIERROS Y CARBONES, S.A.

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HICASA specialises in the storage, transformation, distribution and commercialisation of railway materials, rails and railway accessories of all types in accordance with both European (UNE EN), as well as American (ASTM) Standards, not to mention others such as AREMA, etc.

HICASA belongs to a private group of companies, GEVIR, which is made up of four enterprises in Spain, and is special in the sense that it combines its role of distributor with that of manufacturer, given that it possesses its own specialist light rail factory, a fact which endows it with a unique market profile. We can boast of a roofed surface area at our installations

of over 13,000 m2, where we dispose of modern cutting and drilling machines that enable us to transform iron and steel and to supply orders of any format and measurement, in accordance with the specifications requested by our clients. We export over 50% of our products abroad.



ICON SISTEMAS DE INFORMACIÓN Y DATOS

- Avd. Santiago Amón, 3-52-34005 Palencia (PALENCIA)
- P: +34 979 70 29 06
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- ehornos@iconmm.com
- www.iconmm.com
- www.denevads.com

Software development company specialized in passenger information systems, digital signage and advertising schedules, covering all areas of transport, either rail/metro, airports, bus or port. ICON Multimedia also has a significant presence in the world of commerce/retail, menuboard, and the banking sector, with worldwide reference clients with more than 40.000 points deployed around the world.

It stands out for the wide degree of customization of your product to suit the needs or requirements of any client or that may be contained in a statement of technical conditions.



IDOM

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- oscar.rico@idom.com
- www.idom.es

IDOM is one of the European leading companies in the field of professional services in engineering, architecture and consultancy. It is an independent company established in 1957 and it has participated in over 30.000 projects in five continents. In 20 countries with 39 offices throughout regions (America: Argentina, Brazil, Canada, Chile, Colombia, USA, Mexico, Perú), Asia (India), Africa (Argelia, Libia, Morocco),

Middle East (Saudi Arabia, UAE), Europe (Belgium, Slovenia, Spain, Poland, Portugal, United Kingdom). More than 3.000 staff possesses the expertise and experience to cover all the phases of a railway project (high speed, conventional, freight, metro, light rail, tramway, stations, depot and workshops), from conception to commissioning and beyond. IDOM will accompany the client by providing the correct technical assistance required for the decision-making process: technical specifications for design, alternatives studies, demand and traffic studies, financial and socioeconomical analysis, basic and detailed design, operational and maintenance plans, works supervision, testing and commissioning.



IKUSI

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Ikusi offers integral solutions for exploiting the diverse means of urban public transport (Bus/BRT/Tramway/Light Rail/Metro/Suburban), as well as in intermodal transport hubs. One proposal, backed up with a track record reaching back more than 20 years in the sector, has the main goal of improving passenger experience, guaranteeing safety, increasing revenue from secondary sources independent from the main activity, and streamlining operational efficiency.



IK4 RESEARCH ALLIANCE

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IK4 Research Alliance is a private and independent alliance of R&D centres, a benchmark in the European R&D context. It comprises 9 organisations in the Basque Country: AZTERLAN, CEIT, CIDETEC,

GAIKER, IDEKO, IKERLAN, LORTEK, TEKNIKER and VICOMTECH.

The IK4 Research Alliance sets out to generate, capture and transfer scientific and technological knowledge mainly to the business framework. This way it contributes towards improving the competitiveness of companies and the progress of society. Nowadays it gathers a staff of 1275 and an income of 102M€ in 2014.



IMPLASER 99, S.L.L.

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Implaser is a Spanish company focused in developing innovative security signs for railway projects. Innovation and quality are our mainstays, as we were the first SME being certified in R+D+I in Spain. Implaser has all the range of products certified by AENOR with photoluminescent values of 150, 300, 580 and 720 mcd/m².

We are also specialized in the manufacturing of informative, security and accessibility stickers for coaches, to be used both indoor and outdoor. Hard work and great concern for innovation has allowed us to develop new products, such as photoluminescent systems combined with electroluminescent and guiding systems by LEDs.



INDRA

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Indra is a world leader and pioneer in the supply of technological platforms for railway operations management, control and supervision, having specific solutions already tested on high speed and conventional lines and metropolitan operations. Indra is also a leader in ticketing systems for transport operators

and has facilities and projects all over the world. Furthermore, Indra develops high-precision safety and signalling systems. At this moment in time, Indra's solutions are completely unique because of their high level of integration and adaptation to the current and future necessities of the railway environment whatever may be the most state of the art technological and operative options. Indra has managed to open a competitive market for the first time based on technological and economical competitiveness.



INECO

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- www.ineco.com

Global leader in transport engineering and consultancy, it has contributed to the development of transport infrastructures for over 45 years in more than 45 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 Ankara-Istanbul line in Turkey and the HS2 project in the United Kingdom.



INGEteam POWER TECHNOLOGY, S.A.

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- 48160 Derio (VIZCAYA)
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- F: +34 94 403 98 37
- traction@ingetteam.com
- www.ingetteam.com

Ingeteam is an expert leader in the development of electrotechnical and power electronics systems providing involving energy exchanges at large. Our capacities and the experience on

the railways sector allow us to offer technological solutions that significantly contribute to reach our customers strategic objectives, leading to maximize operational efficiency. We strive towards offering in-house/ state-of-the-art developments for:

- Rolling Stock: Traction Systems and TCMS
- Infrastructure: Energy Recovery Systems.



INTERNACIONAL HISPACOLD, S.A

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- F: +34 954 999 728
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Hispacold is a World leader company for climate systems specialized in comfort for people with more than 30 years' experience. Hispacold designs and manufactures HVAC solutions for all rail vehicles: trams, metros, EMUs, DMUs, LRVs... with proven and reliable technology solutions. In Hispacold each activity is based on a solid quality culture and on a real commitment with the environment.

Quality certifications ISO 9001, ISO 14001, OSHAS 18001 are only the smallest part of this working way.

Hispacold is a company of Irizar Group SC, which employees more than 3.000 people in the five continents and has a global turnover of more than 550 Million €.

This gives Hispacold the benefits from a multinational organization while maintaining an individual company spirit. Hispacold's presence in the five continents guarantees the best technical assistance at any place of the world.



INSERAIL, S.L.

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This is an engineering and consulting firm founded in 1994 and focused on the railway,

energy and building sectors, developing its activity in the different stages of planning, design, construction and exploitation of investments.



JEZ SISTEMAS FERROVIARIOS, S.L.

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► www.jez.es

JEZ Sistemas Ferroviarios, S.L. is committed to designing, manufacturing, supplying and maintenance of all types of manganese steel switches and railway track systems, in addition to moulded cast steel parts for the general industry. Our Technical Department (Department of 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 or spare tongues. At JEZ Sistemas Ferroviarios, S.L. we fit our developments to meet clients needs.



KELOX, S.A.

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Kelox launched its railway activity in 1977, manufacturing catering equipment for dining cars on longdistance lines. The experience and knowledge acquired over the years have become Kelox specialist in the design and full supply of galleys and catering equipment for high-speed,

shuttle and regional trains. Our style of design is characterised by harmony; it is beautiful, ergonomic and functional, always according to the customer specifications.



LADICIM (UNIVERSIDAD DE CANTABRIA-LABORATORIO DE LA DIVISI3N DE CIENCIA E INGENIERÍA DE LOS MATERIALES)

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The mechanical laboratory LADICIM - UC transfers to society the knowledge available in the University, through continuous advisory services and agreements with companies and institutions for the development of R&D+i, and captures the areas in which the knowledge must be further enhanced, to then offer a better service.



LA FARGA, S.A.

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La Farga Yourcoopersolutions is a model company in the railway sector, with more than 200 years' experience in the copper industry. A solid international presence and continuous innovation in the search for new alloys have enabled it to produce high-service materials. La Farga Lacamba provides global solutions for copper materials and its

alloys such as CuMg, CuSn or CuAg, integrating the whole productive process and ensuring the maximum technical qualities.

These products satisfy the needs of the market for all kind of lines and speeds around the world.



LAMAIGNERE CARGO

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Spanish company with a presence through its network of collaborators and with its own offices in different markets, dedicated to international air and sea transport services, assessment and customs management.



LANDER SIMULATION & TRAINING SOLUTIONS, S.A.

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► www.landersistimulation.com

Lander Simulation & Training Solutions, S.A., is a Company specialising in the design, development and implantation of state-of-the-art commercial simulation devices aimed at training professional drivers of all types of railway rolling stock (underground, tramways, regional, long distance and high-speed rail networks).

It boasts a powerful sales teams that has developed a direct sales technique to potential clients both in Spain and abroad.



LIMMAT M&M S.L.

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

Limmat Group boasts extensive experience in the rail infrastructures sector, supporting the processes and projects of its clients through comprehensive solutions aimed at engineering, consulting and technological and innovative products that maximise efficiency in their engineering and consulting operations: Limmat Group is a specialist in management and consultancy and engineering activities of all types of PPP projects, with maximum specialisation in railway infrastructures.



LUZNOR

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Luznor Company is specialized in the design, manufacture and commercialization of professional torches (for railway industry), emergency lighting (for industry and architecture) and other Electronic devices. Luznor offers you (in its factory in Vitoria) highly qualified technicians, a high standard of quality, an effective system development, manufacture and testing, and above all, a philosophy of commitment to our customers allowing us to offer innovative products equipped with advanced technology and recognized prestige.



MB SISTEMAS, S. COOP.

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MB SISTEMAS is part of MONDRAGON CORPORATION. We develop turnkey "World

Class" engineering projects, implementing automation solutions into the Assembly and welding phases of manufacture process for car body structures of railroad passenger cars. We give "ad hoc" solutions for the customer's needs; having implanted successfully our facilities around the world. As engineering we develop both, robotic installations and special machines for any assembly process.



METALOCAUCHO, S.L.

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► F: +34 943 33 37 51
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► www.metalocaucho.com

MTC specialises in the design and manufacture of anti-vibration and suspension solutions for Rolling stock. The Company was established in 1982 and currently has three manufacturing sites, located in Spain (HQ), China and India. In 2009 the company was awarded IRIS Certification. MTC, being among the leading companies in its sector, supplies to the main Rolling stock Constructors worldwide, including Alstom, Bombardier, CAF, CSR, CNR, Hyundai Rotem, Siemens, Talgo, Vossloh). We also collaborate with Operators for the supply of spare components for their overhaul projects. Our main products are rubber-metal primary and secondary suspensions, focusing on primary springs (conical or chevron type), guiding bushes, guiding links, secondary air springs and emergency springs, traction rods, elastic bushings, buffers, layer springs as well as a diverse range of associated rubber-metal solutions.



MGN TRANSFORMACIONES DEL CAUCHO, S.A.

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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.



NEWTEK SOLIDOS S.L

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► www.newteksolidos.com

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.



NEM. NUEVAS ESTRATEGIAS DE MANTENIMIENTO, S.L.

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► www.nemsolutions.com

At NEM Solutions we offer total control of business operations and maintenances for the railway industry. Our products and services project the assets' future from data generated daily. The objective is to give our client the possibility to control his/her own business and to avoid surprises.

Thanks to our expert knowledge we provide wheel life management, productivity improvement and O&M cost reduction.



P4Q ELECTRONICS, S.L.

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(VIZCAYA)
- P: +34 94 498 20 28
- ialberdi@p4q.com
- www.p4q.com

At P4Q we are involved in the complete development of electronic devices and lean production services. We are structured as an integral supplier of electronics solutions, focused in flexibility and quick development. We design under customer specs and approval. Being a partner of our customers giving global support attending local production demands. Is the basis of our strategy. We have facilities in Albuquerque (NM), USA as well as in Spain.



PARRÓS OBRAS, S.L.

- Ctra. Virgen del Monte, 1
13260 Bolaños de Calatrava
(CIUDAD REAL)
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- F: +34 926 88 47 06
- rocio@parros.es
- www.parros.es

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), PARRÓS 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.



PRETENSADOS DEL NORTE S.L.

- Miravalles, 4 (Zona Industrial de Betoño) 01013
Vitoria (ALAVA)
- P: +34 945 258 431
- F: +34 945 261 400
- pretenorte@pretenorte.com
- www.pretenorte.com

PRETENSADOS DEL NORTE produces the best prestressed wire for railway sleepers in the world. More than 30 years' experience, PRETENORTE only uses the best raw materials and we can supply any need required by the client. We have supplied prestressed steel for several projects around the world and our material is considered the one with the best quality in prestressed WIRE world. We have the best and most modern machinery and a highly qualified team of experts and engineers. We also produce prestressed steel used in precast concrete parts and structures.



PATENTES TALGO, S.L.

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(MADRID)
- P: +34 91 631 38 00
- F: +34 91 631 38 93
- marketing@talgo.com
- www.talgo.com

Talgo, leading High Speed rolling stock manufacturer in Spain, has over 70 years of experience manufacturing very high speed, high speed, intercity and regional trains, tilting passenger coaches and locomotives.

The company is also a pioneer in providing complete maintenance solutions to railway operators worldwide, and is specialized in the design and manufacture of maintenance equipment for any type of rail vehicles.



PRECON; PREFABRICACIONES Y CONTRATAS, S.A.U.

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- F: +34 91 359 12 46
- fsanchez@precon.cemolins.es
- ferroviario@precon.cemolins.es
- www.cemolins.es

PRECON is the Spanish leader in design and supply of precast concrete products for railway tracks, either ballasted and ballastless tracks. PRECON has supplied solutions based on monoblock, twinblock, block, slabs and sleepers for switches and crossings. Either for high speed, conventional lines, heavy haul, subways and tramways. PRECON from its two Spanish factories has supplied more than 15 millions twinblock sleepers, 5 millions monoblock sleepers, 500,000 ml sleepers for switches and crossings and currently manufacture most of the slab track systems in use in Spain.



SEMI, S.A. (GRUPO ACS)

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(MADRID)
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- F: +34 915 218 597
- ferrocarr@semi.es
- www.semi.es
- www.grupoacs.com

A society in international expansion. With the adaptability of a small business, the infrastructure of a big company and the financial backing of a large group. SEMI is encompassed in the major companies of Industrial Services sector of the ACS group. Focused in the industrial field, SEMI build infrastructures for energy, transport, communication, environment and non-residential building. Activity in the railway area: Electrification and Traction

Substations for AC and DC, Auxiliary Electrical Equipment, Engineering and Consulting, Maintenance of Catenary and Substations, Infrastructure for Railway Signaling and Communications.



SEGULA

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- F: +34 917 991 113
- www.segula.es

SEGULA Technologies is an international engineering consultancy group specialised in cutting-edge innovation. Since 2002, SEGULA Technologies is present in Spain. We are an engineering services company with more than 1.000 professionals working in Staffing, Consultancy, PLM and Fixed Price Projects. It is based in 12 locations in Spain: Madrid, Barcelona, Vitoria, Zaragoza, Bilbao, Pamplona, Vigo, Valladolid, Vigo, Valencia, Sevilla and Cartagena close to the main customers. In 2016, SEGULA Technologies turnover in Spain was more than 54 million Euros. More than 60% of our collaborators are university graduates. Our customers include leading companies in leading sectors: aeronautical, automotive, energy, industry, IT, rail, etc...



SENER INGENIERÍA Y SISTEMAS, S.A.

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 - dep.infraestructurasytransporte@sener.es
 - www.ingenieriaconstruccion.sener
- Sener is one of the leading engineering and technology groups in Europe with over one billion euros of annual turnover, more than 5,000 professionals and a continuously growing international presence with offices in more than 15 countries.

In the field of railway engineering, Sener count 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 or ICE services.



SICE TECNOLOGÍA Y SISTEMAS

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- www.sice.com

SICE Tecnología y Sistemas, (SICE TyS) is a multinational group of Companies, technology and systems integrators operating in the fields of traffic and transport, environment and energy, telecommunications and all types of industrial processes. SICE TyS's transport activities are focused on meeting the needs of users, operators and transport operation concessionaires in the transport sector.

As a systems integrators and systems suppliers, they offer unique technological solutions tailored to all kind of installations. Design of the Centralized management of all services that complement any form of public or private transport and integrates different solutions and systems:

- Security&Safety Systems for Metros and Railways
- Telecommunications Systems for Metros and Railways
- Signaling: (Interlocking, Level Crossing, CTC)
- Electric BRTs
- Ticketing
- Public transport prioritization
- Consulting Engineering (OFITECO): Railways lines, Tunnels, Load test (railways bridges).



SIEMENS RAIL AUTOMATION S.A.U.

- Ronda de Europa, 5
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- P: +34 91 514 80 00
- www.siemens.es/railautomation

Siemens Rail Automation is the resulting Company after the acquisition of the Invensys Rail Dimetronic group by Siemens. The new division offers integrated mobility solutions through the most advanced technologies for railway signalling and train control. Our main purpose is the supply of "turn-key" projects, including all the phases of design, development, supply, manufacturing, installing, testing, commissioning and maintenance of railway signalling systems and automatic train control systems for either mass transit applications as main line and high speed lines.

The solutions and systems of Siemens Rail Automation allow railways and metropolitan networks to improve the safety of their railway application; increase the capacity of the lines; reduce operating costs; optimize maintenance works; obtain a better usage of its rolling stock, having at the same time lower energy consumptions rates and to decrease energy consumption.



STADLER RAIL VALENCIA S.A.U.

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(VALENCIA)
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- F: +34 96 141 50 02
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- www.stadlerrail.com

The new Spanish División of Stadler has a long history as rail vehicles provider. Stadler Rail Group completed the purchase from the Vossloh Group of its Spanish business unit of manufacture of locomotives and light rail vehicles at the end of 2015. This acquisition falls within the long term growth strategy of the Stadler and reinforces its position as one of the leading manufacturers of

railway vehicles with new products and the access to new markets.

Technology and quality are the key points of the entire range of products developed and produced in the Valencia plant. Closely linked with the industrial heritage of railways and with the benefit of more than a century of experience, Stadler Rail Valencia designs and manufactures state-of-the-art locomotives as well as passenger trains and provides a comprehensive range of services such as the maintenance of the vehicles, spare parts logistics, technical support or training.



Talleres Alegría, s.a.

TALLERES ALEGRÍA, S.A.

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33192 Llanera (ASTURIAS)
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- www.talegria.com

Talleres Alegría with more than 100 years at the service of railway's networks, offers to its customers a wide range of fixed track equipment with the best quality and service conditions. Following its own technical design or its customer's, Talleres Alegría manufactures among other turnouts for High Speed Lines, conventional Lines, subway and Tramway lines, as well as End Forged Switch Points and Track Vehicles. Being aware of the relevance of comfort within the railway sector, Talleres Alegría has collaborated with leading companies developing and applying technical solutions for mitigating noise and vibrations during the crossing over the turnouts.



TECNALIA (FUNDACIÓN TECNALIA RESEARCH AND INNOVATION)

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- www.tecnalia.com

CITEF was created in 1998 as part of the F212 (Foundation for the Promotion of Industrial Innovation) for the purposes of development, innovation, experimentation, study and training in the railway knowledge area. This is a non-profit organisation that pursues general interest aims within any relevant rail transport technology sector.



TECTATOM

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- www.tecnatom.es

Tecnatom has more than 50 years of experience in the application of Non Destructive Testing (NDT) to the inspection of components.

It also offers its high technological level in the development and application of inspection systems and techniques to the railway market, where security and quality control are increasing required.

Tecnatom can provide its depth knowledge on materials currently used or tested in the railway sector (metals or new materials carbon-fiber based), taken advantage of its activities in the nuclear and aerospace sectors.

The main fields where it is carrying out activities in the railway sector are:

- Inspection services for infrastructures and rolling stock
- Development of inspection techniques and procedures
- Development of inspection equipment and systems (ultrasonics, eddy currents) for rail transport components (track, axles, bogies, wheels)
- Training of operators on Non-Destructive Testing (NDT) techniques
- Development of training simulators for train drivers.



TECNIVIAL

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- www.tecnivial.es

Created in 1973, Tecnivial is the Spanish reference in traffic safety. It contributes giving solutions regarding Airport, Railways, and Road Signaling and marking.

The challenge for a permanent evolution, technological innovation, and customer's satisfaction are our identity signs. In Tecnivial we specialize in all types of fixed signalling for roads, both conventional and high speed lines; in this last section are one of the companies approved by the Railway Infrastructure Administrator (ADIF). We have extensive experience in railway stations signalling, carefully following the specifications of the corporate identity manuals. We develop comprehensive and customised signage projects, from project design to final installation and maintenance service.

Tecnivial has always been committed to the I+D+i, which has allowed it to be a reference in the fixed railway signaling, high-speed and conventional network, while being present in the most relevant projects at the national level; this is the case of the Madrid-Figueras or Olmedo-Orense sections, and internationally, Ave Medina-La Meca.



TEKNORAIL SYSTEMS, S.A.

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Teknorail Systems, S.A. is a company belonging to the EUROFINSA Group, whose activity focuses on the development of railway interior projects, aimed both for the refurbishment of existing vehicles and also for new rolling stock, with a scope of supply

that ranges from the design and engineering to the industrialization and material supply, including the technical assistance to the car commissioning.

Teknorail's main goal is to provide its customers with high-quality solutions for railway interiors by means of innovation, global project management, modular supply and flexible solutions.



TELICE

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Telice is a Spanish company with 39 years of experience in several fields of technology installation, especially for the railway sector.

Our activities cover design, installation and maintenance for Railway Electrification Systems, Railways Safety and Signalling, Optical Fiber, Industrial Automation and Electrical Installations. Our extensive experience has made Telice a preferred partner for carrying out work and providing services for important railroad administrations and major construction and technology companies in the railroad industry.



Teltronic, S.A.U.

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- www.teltronic.es

Backed by over 40 years of experience in the design, manufacturing, and deployment of Professional mobile radio projects worldwide, Teltronic presents a broad portfolio of critical communication solutions for transport sector, providing complete solutions: network infrastructures, control centres, and end-user equipment, including specialized onboard systems specifically designed to meet train, metro, tram and LTR needs.

The company's technical independence and willingness to customize its solution to each specific project allow Teltronic to fulfil the most demanding requirements in both communication and security systems. Besides voice and data transmission solutions, the company offers a wide portfolio of integration services with other subsystems, such as interconnection with PA and intercom systems, applications to manage and control fleets and for operating aid, real time CCTV in trains and stations or communications support for signalling systems ETCS, CBTC, PTC, among others.



THALES ESPAÑA GRP, S.A.U.

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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, Egypt 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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With more than 50 years of experience, TPF GETINSA EUROESTUDIOS has grown into a leading business group in Spain and an international benchmark in the engineering sector of transportation infrastructures and the environment. The projects and studies required to develop public works and linear infrastructures are achieved thanks to our human and material resources.

We are experts on the comprehensive management of infrastructure in all its phases, starting from the preliminary design up to the operation and maintenance, including all the intermediary steps as profitability analysis, studies, projects, works control and supervision, as well as financial management. These activities are developed both in Spain and abroad. Our international delegations have been established in different countries and our experience extends over 40 countries in Europe, Asia, America, Middle East and Africa. We are currently working international projects in 30 countries. At present, the TPF Getinsa-Euroestudios employs more than 1200 professionals, two thirds of whom are university graduates.

TRIA INGENIERÍA Y TÉCNICA DEL TRANSPORTE

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TRIA empezó como empresa especializada en soluciones para las tecnologías de cambio de ancho automático. Nuestros clientes nos demandaban un abordaje EPC que incluyera el diseño y desarrollo de la solución tecnológica, la construcción de las obras civiles, la fabricación de las estructuras y mecanismos, la instalación mecánica, eléctrica, de vía, de catenaria, comunicaciones, señalización ferroviaria y la puesta en marcha como solución terminada y funcionando. De esta manera nos convertimos en expertos en las distintas tecnologías ferroviarias. Tenemos nuestros talleres de fabricación, nuestra maquinaria ferroviaria y por encima de todo contamos con equipo altamente cualificado y motivado.



TYPSA

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Typsa Group is one of the most important European consulting groups and leader in the fields of civil engineering, architecture and the environment. Since its creation, in 1966, Typsa Group's ever-increasing activities, having focused both on preliminary assessment and on design, as well as supervision and/or management of construction projects in Europe, the Americas, Africa and the Middle East. Typsa is one of the most experienced Spanish consulting firms in the field of railways and metro systems. We have been involved in more than 4,700 km of High Speed lines (HSL), 2,600 km of conventional lines, 390 km of conventional metro and 450 km of tram and light-rail transits.



VALDEPINTO, S.L.

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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.
- Metal transformation and welding.
- Design and fabrication of transformers and coils of high/low voltage. Our philosophy is to always offer all our clients an unbeatable value for Money, combined with an excellent service.



VICOMTECH (FUNDACIÓN CENTRO DE TECNOLOGÍAS DE INTERACCIÓN VISUAL Y COMUNICACIONES)

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Vicomtech is an applied research centre, founded in 2001 and located in the San Sebastián Technology Park, which develops technological solutions in the fields of Computer Vision, Data Analytics, Computer Graphics, Advanced Interaction, and Language Technologies. The results of their research projects are applied to various sectors such as automotive, rail, intelligent transport systems, industry and advanced manufacturing and energy, amongst others. All of its activities are regulated with the R&D+I management system, such as the continuous improvement of results and its measurement, the optimisation of technological innovation processes, as well as the transfer and generation of knowledge, thus ensuring that it uses methodologies of the very highest quality.

ZFoam

ZFOAM

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The company provides complete solutions tailored to the needs of its customers with accurate technical support. They have equipment that covers all the specialist processes of transformation of plastic foams, along with low and high temperature insulation. They have vertically integrated the semi-transformation and final transformation processes, so that a complete service is offered from the raw material to the final product, including the choice of the most suitable materials and the design process.

Flexibility
is the key



How to choose among many options the most appropriate way for your project?

In every railway project you have to be prepared to quickly provide an **innovative solution**, tailored to any unforeseen situation. Like this **four-line turnout**, designed to make possible the coexistence of different track widths in a single layout, and installed in the Autonomous Port of Barcelona. A good example of **flexibility and innovation**.

At Amurrio we design, produce and install railway equipment since 1880. Our turnouts are present in lines of **conventional rail, high speed, metro, tram and heavy-haul** all over the world. Our automated warehouse has **more than 1,000 models** ready to go into production in record time. And the technical office of Amurrio is prepared to create **solutions tailored** to any need.

If you do not know how to choose among so many options, talk to Amurrio first.

We will show you the most appropriate way to **take your project to success**.





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