Innovation in Architectural Envelopes

Comprehensive capabilities on development, performance assessment and characterisation of your product to enhance your value proposition and market success.
TECNALIA Research & Innovation is the first privately funded applied research centre in Spain and one of the leading such centres in Europe. A combination of technology, tenacity, efficiency, courage and imagination.

We identify and develop business opportunities through applied research. Inspiring Business is a different, unique vision: we visualise ideas that generate value and provide creative technological solutions to produce real results.
At TECNALIA we are organised in 6 fully interconnected Business Divisions. Cooperation works thanks to the transversality of teams, projects and clients collaborating with each other, combining expertise and commitment. Our best asset is our team, made up of more than 1,500 experts who work to transform technology into GDP in order to improve people’s quality of life by generating business opportunities for companies.

We are committed to the future, society, our planet and our environment. This responsibility provides focus to our values and reinforces our activities.

“TECNALIA transforms Technology into GDP to improve people’s quality of life by generating business opportunities for Companies”
Innovation in Architectural Envelopes

TECNALIA is your strategic partner for the development of new products and the improvement of the performance of your current portfolio aimed at the Architectural Envelope sector. We offer the industry RTD, Intellectual Property transfer and technological services customised to meet the needs of the industry, with a focus on value proposition and market success.

We have modern laboratories and the technological knowledge to fulfill the needs of the Architectural Envelope sector for the development, performance assessment and characterisation of innovative products for their commercialisation.

TECNALIA is also working in the integration of electronic systems and IT technologies in the several components of the Architectural Envelopes to face the development needs of the new “Smart Products” for the “Façades of the Future”.

At TECNALIA it is possible to assess your new developments from the prototype stage to the final product in facilities designed specially for that purpose, by assessing performance and functionality of all the components of an Architectural Envelope, to guarantee their safety and reliability.
RELIABILITY

Innovation

Ventilated Façades

Testing

On-site Tests

WATERTIGHTNESS

acoustic comfort

Fittings

smart

DOORS

thermal comfort

Future

Joints

Sustainability

Code

Profiles

SUPERINSULATION

Glass

Fire

Safety

Sealants

Glass

Characterisation

Future

Innovation

Fittings

Sealants

Markets

harmonisation

SOLAR PROTECTION

CHALLENGES

security

NEW MATERIALS

Energy Efficiency

WIND

assessment

WATERTIGHTNESS

harmonisation
TECNALIA fulfills the needs of the Architectural Envelopes sector for the development and market launching of innovative products.
Holistic Development of Solutions for the Optimisation of the Energy Efficiency in Buildings

NEAR ZERO ENERGY BUILDINGS “NZEB”

The research developed at international level, allows to state that the achievement of the energy efficiency in buildings is the result of three approaches needed to be solved:

- The improvement of the energy efficiency in buildings through the architectural or construction solutions and the envelope insulation materials performance.
- The reduction of the energy consumption by means of an optimisation of the climatisation, lighting and ventilation of the indoor environment, with the support of intelligent building management systems (BMS).
- The increase of the renewable energy generation to make the building co-responsible for the harvesting of the energy necessary to meet the demands of the occupants.

In KUBIK innovative products and systems are developed and assessed for the optimisation of the energy efficiency of the building, from the concept stage up to its implementation.

Thanks to the commitment of TECNALIA in the Energy Efficiency in Buildings and the research infrastructure KUBIK, it is possible to offer the industrial sector the support to benefit from the opportunity of the energy efficiency in buildings challenge.

In conclusion, there is a need for a comprehensive and more realistic analysis of the buildings, and, as result, there is an opportunity to develop new products and services.
Research and Technological Development

Solutions for the building envelope with low environmental impact

The relevance of sustainability in construction is totally consolidated and the industry of materials is aware of the necessity to offer constructors and specifiers solutions with lower environmental impact but economically competitive in the marketplace.

Lately in TECNALIA we have developed new concepts and validated prototypes of solutions made of biobased materials with low-embodied energy (biomaterials) as well as recycling of subproducts for both the envelope and thermal insulation. Some examples include: “Forest based composites for façades and interior partitions to improve indoor air quality”; “Thermal performance evaluation of an industrialized façade based on biomaterials”; “High durability and fire performance wood-plastic composites (WPC) for ventilated façades”.

High performance envelopes based on superinsulation materials

The EU Directives settle the more demanding energy efficiency requirements, for new building and for the retrofitting of the building stock, leading to new and improved insulation materials.

The traditional insulation materials lack enough performance to meet the new requirements on energy efficiency: new technologies and improved characteristics to provide innovative functionalities such as light weight, low thickness and increased insulation.

For that, TECNALIA bet on superinsulation materials to deliver “Envelope solutions based on superinsulation materials (aerogels and nanomaterials) for the improvement of the energy efficiency of buildings.”

Cloud software for the collaborative design (industry - architect) of projects for the building envelope

- Design stage process automation by means of web based virtual models (e.g. BIM) for the optimisation of the engineering offices for the workflow and cost minimisation.
- Improvement of collaborative design along the whole value chain for an effective involvement of all the stakeholders.
- Comprehensive interoperability between existing formats and software for performance assessment (energy, acoustics...); based on shared models on web to guarantee greater productivity on the design stage and on the operation stage of the developed systems.
New solutions with renewable energy integration in the architectural envelopes

The achievement of nearly zero-energy building (NZEB) is a demanding challenge that requires the design for the self-sufficiency of the building in relation to satisfy the demand for climatisation and indoor comfort according to the intended occupancy. TECNALIA’s offer is the integration of the renewable solar thermal energy harvesting and supply in Smart Solutions for the envelope. These solutions are based on the design of new systems for low intrusive energy retrofitting and envelope industrialisation by means of: “The use and management of the harvested thermal energy in the air gap of the ventilated façades”; “The use of the solar thermal energy as support to the HAVC system and performance improvement”. In addition, at TECNALIA we do not forget the relevance of the photovoltaic integration (BIPV) in the envelope; for that, our own system has been developed and patented: Modular PV Curtain Wall.

Smart Envelopes. Environment adaptable solutions for the improvement of user comfort

Due to the relevance of the envelope to improve the building thermal and energy performance, in the last years, significant advances are being made to integrate new functionalities and capabilities in the envelope to adapt it to outdoor and indoor environments. This is being achieved by means of sensors and actuators that allow changing the building thermal and energy configuration according to real demand. However, for that to happen it is necessary to have solutions able to manage correctly unbalanced scenarios of energy generation and energy demand in the building. TECNALIA is making a great effort in the development of these systems able to benefit from the energy harvested in the envelope and, at the same time, to improve the performance and efficiency of the building energy installations.
Curtain Walls

RTD ACTIVITIES
- Development of curtain wall systems with composite profiles.
- Development of curtain wall systems made of biomaterials.
- Development of curtain wall systems with translucent and/or transparent profiles.

Aimed at:
- Manufacturers of light façades and curtain walls.
- Construction specifiers.
- Constructors.
- Developers.
- ...

TECHNOLOGICAL SERVICES
- Product development: Design of building envelope made of aluminium, steel, timber and glass.
- Advanced studies on acoustics and structure/mechanical analysis.
- Eco-design.
- Integration of systems for the envelope's sensorisation and control and energy generation.
- 3D Design & BIM integration, new building, assembly and distribution processes.
- Testing to national and international standards and regulations.
- Curtain Wall's CE mark: initial type tests.
- Ad-hoc test protocols to assess the performance of “Landmark Buildings” or highly innovative buildings.

TESTING
- Air permeability, watertightness and resistance to wind load.
- Impact tests.
- Thermal transmittance.
- Fire Resistance tests.
- Seismic tests.
- Acoustic insulation.
- Thermal dilatation.
- Watertightness under dynamic pressure.
- Equipotentiality.
- Resistance to live load.
- "On-site" tests to monitor the correct installation of enclosures.
Ventilated Façades

We provide solutions that work through technology, innovation and knowledge.

RTD ACTIVITIES

- Energy performance optimisation for ventilated façades.
- Development of ventilated façades with integration of HVAC systems.
- New ventilated façades systems made of wood-plastic composites (WPC) with high durability and fire performance.

Aimed at:
- Manufacturers of light façades and curtain walls.
- Construction specifiers.
- Constructors.
- Developers.
- ...

TECHNOLOGICAL SERVICES

- Advanced studies: energy efficiency.
- Use of new materials with improved performance against weathering, fire, etc.
- Advanced studies on acoustics and structure/mechanical analysis.
- Eco-design.
- Integration of systems for the envelope’s sensing and control and energy generation.
- 3D Design & BIM integration, new building, assembly and distribution processes.
- Testing of the façade and its components to national and international standards.
- Issue of European Technical Assessments (ETA) to CE mark the façade.

TESTING

- Fire resistance and reaction to fire.
- Acoustic insulation.
- Watertightness.
- Water vapour permeability.
- Resistance to wind pressure and suction.
- Mechanical resistance tests.
- Hard and soft body impact tests.
- Durability tests.
- "On-site" tests to monitor the correct installation of enclosures.
Glass

RTD ACTIVITIES
- Development of new materials with translucent and/or transparent profiles.

Aimed at:
- Building Glass manufacturers.
- Special glass manufacturers.
- Insulated glass units manufacturers.
- ...

TECHNOLOGICAL SERVICES
- Tests to assess compliance with standards and regulations.
- Consultancy on glazing’s failure and its cause.
- Characterisation of special glazing.
- Study of the performance of glazing under specific climate and mechanical requirements.
- Issue of European Technical Assessments (ETA) for CE mark.
- Advanced studies on acoustics and structure/mechanical analysis.

TESTING
- Mechanical tests: fragmentation, compression strength measurement, mechanical strength, pendulum test and manual attack tests (ball drop and axe test).
- Optical characteristics: transmittance, reflectance and absorptance UV-VIS-NIR color coordinates, optical distortions and secondary image separation.
- Durability of laminated glass: humidity, high-temperature and radiation tests.
- Fire resistance and reaction to fire of laminated glass and insulating glass units.
- Thermal transmittance.
- Airborne sound insulation.
- Characterisation of IGUs: Moisture penetration index, gas leakage rate, etc.
Windows and Accessories

RTD ACTIVITIES

- Integration of automated ventilation on window profiles.

Aimed at:
- Manufactures of:
  - Windows.
  - Aerators.
  - Shutter casings.
  - Louvres, awnings.
  - Window’s hardware.
  - Window accessories in general.

TECHNOLOGICAL SERVICES

- Assessment of performance under national and international standards and bespoke procedures.
- Compulsory and voluntary certification: CE mark, ecological label, etc.
- Product development: design of windows made of aluminium, steel, timber and glass.
- Advanced studies on acoustics and structure/mechanical analysis.
- Advanced studies on energy efficiency.
- Eco-design.
- Integration of systems for the sensing and control of windows and energy generation.
- Integration of systems for energy generation and shading.
- 3D design and BIM integration: new building, assembly and distribution processes.
- Study of advanced materials for the development of new systems.

TESTING

Collaboration with the manufacturer on the compliance with different requirements, both mandatory (CE mark) and voluntary (quality labels, internal monitoring for factory production control).
- Air permeability.
- Watertightness.
- Resistance to wind load.
- Loadbearing capacity of safety devices.
- Thermal insulation through testing or simulation.
- Airborne sound insulation.
- Reaction to fire and fire resistance.
- Durability.
Doors and Components

RTD ACTIVITIES

- Development of panic Electronic Activated Systems (EAS) and innovative control access.

Aimed at:
- Manufacturers of:
  - Pedestrian doors.
  - Fire doors.
  - Security doors.
- Specifiers.
- Developers.
- Construction companies.

TECHNOLOGICAL SERVICES

- Assessment of performance under national and international standards and bespoke procedures.
- Compulsory and voluntary certification: CE mark, N mark, etc.
- Technological partner for CERTIFIRE to get access to international markets.
- Certification of fire products issued by DCD (Dubai Civil Defense) for the United Arab Emirates.
- Issue of European Technical Assessments (ETA) for CE mark.
- Advanced studies on acoustics performance and fire protection.
- Integration of systems for the sensorisation and control.
- Study of advanced materials for the development of new systems.

TESTING

- Fire resistance.
- Airborne sound insulation.
- Thermal transmittance calculation.
- Mechanical durability.
- Air permeability - watertightness - resistance to wind load.
- Burglar resistance tests.

TECNALIA is the only lab in Spain providing a comprehensive service on door’s security.
Sandwich Panels

RTD ACTIVITIES

• Development of sandwich based solutions with integration of solar collectors.
• Durability assessment of sandwich panels for building cladding and roofing.

Aimed at:
• Manufacturers of sandwich panels made of metal or wood derivatives.

TECHNOLOGICAL SERVICES

• Assessment of performance under national and international standards and bespoke procedures.
• Third party assessment for voluntary certification: N mark.
• Characterisation and performance assessment: mechanics, acoustics, physics, chemistry, fire protection.
• Technological services for performance improvement.
• Design of ad-hoc test procedures for innovative products.
• Issue of European Technical Assessments (ETA) for CE mark.
• Advanced studies on acoustics and structure/mechanical analysis.
• Eco-design.
• Study of advanced materials for the development of new systems.

TESTING

Mechanical Tests on End Product /
• Dimensions and safety requirements.
• Stability, resistance to static load, impact, drop and fatigue tests.

Physical-Chemical Tests on Raw Materials /
• Tensile strength, elasticity, impact, abrasion, bending, colour, gloss.
• Natural and artificial ageing: QUV, ATLAS Ci3000, climate chambers, salt spray, cold check, humidity.

Fire Performance Tests /
• Fire reaction, resistance to fire, toxicity of smoke.

Acoustics /
• Airborne sound insulation, acoustic absorption.
Fixings

RTD ACTIVITIES

- Development of joints for envelopes with large format cladding.
- Development of joint systems for open prefabricated structures.

Aimed at:
- Manufacturers of light façades and curtain walls fixings systems.
- Construction specifiers.
- Constructors.
- Developers.
- ...

TECHNOLOGICAL SERVICES

- Issue of European Technical Assessments (ETA) for CE mark of fixings.
- Advanced studies on structure and mechanical analysis.

TESTING

- Assessment of performance under national and international standards.
- Design of bespoke test procedures.
- "On-site" tests to monitor the correct installation of fixings.
- Shear strength test.
- Tensile strength test.
- Vertical load test.
- Pulsating loads.
- Corrosion resistance tests.
Roofs

RTD ACTIVITIES

- Development of BIM solutions for the optimisation of the collaborative architecture in the design of steel and glass roofs.

Aimed at:
- Manufacturers of roofing systems.
- Construction specifiers.
- Constructors.
- Developers.
- ...

TECHNOLOGICAL SERVICES

- Assessment of performance under national and international standards and bespoke procedures.
- Initial Type Testing for the CE mark of roofs.
- Ad-hoc test protocols to assess the performance of “Landmark Buildings” or highly innovative buildings.
- Advanced studies on acoustics.
- Advanced studies on structure/mechanical analysis.
- Advanced studies on energy efficiency.
- Eco-design.
- Analysis of building process and application; automation of building processes.
- Integration of systems for the sensorisation and control and energy generation.
- 3D design and BIM integration: new building, assembly and distribution processes.

TESTING

- Wind pressure and suction tests.
- Flooding test.
- Impact resistance.
- Mechanical resistance.
- Durability test.
- Thermal resistance.
- Fire resistance and reaction to fire.
- “On-site” tests to monitor the correct installation of the roof.
Ducts

TECHNOLOGICAL SERVICES

Aimed at:
• Ducts manufacturers
• Construction specifiers.
• Constructors.
• Developers.
• ...

• Issue of European Technical Assessments (ETA) for CE mark.
• Ad-hoc test protocols to assess the performance of "Landmark Buildings" or highly innovative buildings.

TESTING

• Durability of fire protection products.
• Fire resistance and reaction to fire.
• Thermal insulation.
• Thermal dilatation.
• Watertightness under dynamic pressure.
• Mechanical resistance and stability.
• Impact resistance.
• Acoustic tests.
• Thermal resistance.
Smoke Control Systems (NSHEV) and Skylights

RTD ACTIVITIES

- Performance based analysis of the alternative fire safety solutions in logistic and warehouse halls.

TESTING

- Operation under adverse conditions (wind or snow loads).
- Operation at low ambient temperature.
- Watertightness.
- Water vapour permeability.
- Resistance to wind pressure.
- Resistance to wind suction.
- Mechanical resistance.
- Hard and soft body impact tests.
- Durability tests.
- Fire resistance.

TECNALIA helps its clients innovate and keep ahead of future developments and respond to their challenges, access new business opportunities, new markets, develop new products.
Adhesives and Sealants

TECNALIA helps its clients keep ahead of future developments and respond to their challenges, access new business opportunities, new markets, develop new products and innovate.

TECNALIA is the only Notified Body in Spain for the CE mark of non-structural sealants.

TECHNOLOGICAL SERVICES

Aimed at manufacturers of:
- Sealant for construction joints and glazing.
- Double glazing sealants.
- Structural sealants.
- Adhesives for wood.
- Adhesives for floors.
- Hot-melt adhesives.
- Structural adhesives to repair concrete, construction adhesives for ventilated cladding.

- Assessment of performance under national and international standards and bespoke procedures.
- Certification, both mandatory (CE mark) and voluntary (N mark).

- Product characterisation.
- Failure analysis.
- Technological Services for performance improvement.
- Ongoing surveillance of production processes through periodic testing.
- Adhesive’s analysis and chemical identification.
- Quantitative and qualitative determination of components.
- Issue of European Technical Assessments (ETA) for CE mark.

TESTING

Physical-Mechanical Tests /
- Mechanical resistance.
- Adhesion cohesion after various ageing.
- Durability.
- Water vapour transmission.
- Compatibility with adjacent materials.

Chemical Tests and Analysis /
- Spectroscopy analysis FTIR, TGA.
- Classification according to French regulation of emissions: Decree 2011-321.
- Proficiency study of sealants for use in contact with food.

Fire Performance Tests /
- Reaction to Fire, Smoke Toxicity and Fire Resistance.

Biological Tests /
- Evaluation of the action of microorganisms.
Paints and Waterproofing Systems

RTD ACTIVITIES

• Coatings with dynamic optical characteristics to improve the energy efficiency in urban environments.
• Eco-houses based on eco-friendly polymer composite construction materials.

Aimed at:
• Manufacturers of paint, varnish and coating for construction.

TECHNOLOGICAL SERVICES

• Assessment of performance under national and international standards and bespoke procedures.
• Certification, both mandatory (CE mark) and voluntary (ecological label).
• Full characterisation of paints and coatings.
• Design of ad-hoc test procedures for innovative products.
• Assessment of the innovation for new building products.
• Consultancy on raw materials and products approval.
• Quantitative and qualitative determination of components.

TESTING

Physical-Chemical Rests on Raw Materials /
• Tensile strength, elasticity, impact, abrasion, bending, colour, gloss.
• Natural and artificial ageing: QUV, ATLAS Ci3000, climate chambers, salt spray, cold check, humidity.
• Permeability to water vapour, liquid water, CO₂, watertightness.

Identification and Composition /
• FTIR, DSC, TGA, HPLC-GC, CG-MS and other techniques.
• Industrial hygiene sampling; ionic chromatography.
• VOC’s analysis.
• Heavy metals analysis: ICP.

Fire Performance Tests /
• Fire reaction, resistance to fire, toxicity of smoke.

Biological Tests /
• Bactericide, fungicide and algicide efficacy.
• Efficacy and ecotoxicity testing of preservatives and biocides.
• Antifouling paints tests.
Innovative Materials

RTD ACTIVITIES

- High durability and fire performance wood-plastic composites (WPC) for ventilated façades.
- Bio-based formulations for Eco-coatings.
- Transforming urban and agricultural residues into high performance biomaterials for green construction.

Aimed at:
- Manufacturers of plastic and composite materials.
- Concrete manufacturers.
- Coatings manufacturers.
- Chemicals manufacturers.
- Wood protection.

TECHNOLOGICAL SERVICES

- Recycling of subproducts generated in industrial sectors, Construction and Demolition and agroforestry into construction materials (concrete, plastic composites, coatings).
- Ecologic cements with low synthesis energy and low CO₂ emissions.
- Nanoadditivated concrete with improved performance (mechanical, etc.).
- New thermal insulators: ecologic (biopolyurethanes, biobased), superinsulators (aerogels).
- Substitution of traditional materials by polymeric composites/biocomposites.
- Improvement of fire performance of materials and adaptation to fire normative.
- Development of halogen-free systems for fire protection.
- Natural biobased protectors and synergists for wood and derivatives.
- Adaptation to environmental normative for wood protection: reduction of the biocide content, improvement of the active fixation, fading reduction,…
- Ecologic coatings: low VOC, biobased resins and additives.
- Functional coatings: control release of substances, sensors, photocatalytic, antigraffiti, self-cleaning, antislippery, thermal, etc.

TESTING

Processing of Plastic Materials / Compounding, extrusion, injection, compression, infusion.

Computational Design and Nano-engineering for Cements and Concrete / Physical-Chemical-Mechanical Tests /
- Mechanical properties: tensile, flexural, abrasion, etc.
- Artificial weathering: QUV, ATLAS, climatic chambers, thermal shock, etc.
- Physical properties: density, softening temperature, contact angle, adhesion, etc.
- Analysis by FTIR spectroscopy, TGA, DSC, chromatography, etc.
- Optical microscopy, scanning electron microscopy (SEM), EDAX, X-ray diffraction.

Fire Performance Tests /
- Cone calorimeter, smoke toxicity, reaction and resistance to fire.

Biological Tests /
- Bactericide, algaecide and fungicide efficacy tests.
- Tests of efficacy and ecotoxicity of preservatives and/or toxicity.

Security in Nanoparticles /
- Environmental, health and in-use security (EHS).
References of Technical Support in Landmark Buildings

<table>
<thead>
<tr>
<th>Botín Arts Centre (Santander)</th>
<th>Baca Tower (Colombia)</th>
<th>Puerto Triana Tower (Sevilla)</th>
<th>Warsaw Spire (Varšava - Poland)</th>
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<tbody>
<tr>
<td><strong>Ownership</strong></td>
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<td>BD PROMOTORES</td>
<td>Torre Puerto Triana (Caixabank)</td>
<td>Eastern Europe Bud</td>
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<td><strong>Design</strong></td>
<td>Alonso Balaguer Arquitectos</td>
<td>Pelli Clarke Pelli Architects</td>
<td>Jaspers Eyers Architects</td>
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<td>Renzo Piano Building Workshop</td>
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<td>Luis Vidal y Arquitectos</td>
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<td><strong>Construction</strong></td>
<td>PRAVIK</td>
<td>Dragados</td>
<td>Gheamco Polska</td>
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<td><strong>Facade Manufacturer</strong></td>
<td>Grupo Aluman</td>
<td>Martifer Construcciones Metalicas</td>
<td>Grup Folcra Edificación 2014</td>
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<td>Doval Building &amp; Disset (2014)</td>
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<td><strong>Glazing</strong></td>
<td>La Veneciana Glass Solutions</td>
<td>Saint Gobain (2014)</td>
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</table>
References of Technical Support in Landmark Buildings

**BBVA HQ LAS TABLAS PHASE 2 (MADRID)**
- **Ownership**: BBVA
- **Design**: HERZOG & DE MEURON - ORTIZ LEÓN ARQUITECTOS
- **Project Manager**: CB RICHARD ELLIS
- **Façade Consultant**: ENAR (ENVOLVENTES ARQUITECTÓNICAS)
- **Façade Manufacturer**: PERMASTEELISA (2014)

**BBVA HQ LAS TABLAS PHASE 1 (MADRID)**
- **Ownership**: BBVA
- **Design**: HERZOG & DE MEURON - ORTIZ LEÓN ARQUITECTOS
- **Project Manager**: GERENS HILL INTERNACIONAL
- **Façade Consultant**: ENAR (ENVOLVENTES ARQUITECTÓNICAS)
- **Louvres System**: MARTIFER CONSTRUCCIONES METÁLICAS

**"MUSIKENE" SCHOOL OF MUSIC (DONOSTIA - SAN SEBASTIÁN)**
- **Ownership**: BASQUE GOVERNMENT - EDUCATION DEPT. UNIVERSITY OF THE BASQUE COUNTRY
- **Design**: GAZ ARQUITECTOS
- **Construction**: UTE MUSIKENE (ACCIONA INFRAESTRUCTURAS - LURGOIEN)
- **Façade Manufacturer**: IMAR (2014)

**MERCAT DELS ENCANTS (BARCELONA)**
- **Ownership**: BIMSA (BARCELONA D’INFRAESTRUCTURES MUNICIPALS S.A.)
- **Design**: B720 ARQUITECTOS
- **Construction**: UTE ENCANTS (OHL - G&O - EXCOVER)
- **Roof**: TEULADES 2012)
TECNALIA delivers a comprehensive technological service in the performance evaluation and technical support in all these projects.

References of Technical Support in Landmark Buildings

**EDP NEW HQ (LISBOA - PORTUGAL)**
- **Ownership**: EDP (ENERGIAS DE PORTUGAL)
- **Design**: ATELIER AIRES MATEUS ASSOCIADOS
- **Construction**: MOTA ENGIL - HCI
- **Façade Manufacturer**: MÁRTIFER CONSTRUCCIONES METÁLICAS (2013)

**MUSEUM OF EUROPEAN HISTORY (BRUSSELS - BELGIUM)**
- **Ownership**: PARLAMENTO EUROPEO
- **Design**: ATELIER D’ARCHITECTURE CHAIX & MOREL ET ASSOCIÉS - JSW ARCHITEKTEN
- **Construction**: GROUPEMENT BPC/CFE
- **Façade Consultant**: WERNER SOBEK
- **Façade Manufacturer**: INDUSTRIAS LAGUNA BELVIS (2013)

**"SAN MAMÉS" NEW STADIUM (BILBAO)**
- **Ownership**: SOCIEDAD SAN MAMES BARRIA
- **Design**: ACXT - IDOM
- **Construction**: UTE SAN MAMES (ACCIONA - INBISA - MURIAS - ALTUNA Y URIA)
- **Façade Manufacturer**: PROIEK HABITAT & EQUIPMENT (2013)
References of Technical Support in Landmark Buildings

**IBERDROLA TOWER (BILBAO)**

- **Ownership**: TORRE IBERDROLA A.I.E.
- **Design**: PELLI CLARKE PELLI ARCHITECTS - ORTIZ LEÓN ARQUITECTOS
- **Structural Engineering**: IDOM
- **Construction**: FONORTE (GRUPO AFER)
- **Facade Manufacturer**: FELIX CONSTRUCTIONS
- **Roof**: ACIEROID (2013)

**ORONA HQ (HERNANI)**

- **Ownership**: ORONA
- **Design**: LKS INGENIERÍA
- **Construction**: UTE ORONA IDEO (CONS. WMARIEZCURRENA, CONS. ZUBIEDER & URBYCOLAN)
- **Facade Manufacturer**: UXAMA

**GRAN CANARIA AIRPORT (GRAN CANARIA)**

- **Ownership**: AENA (AEROPUERTOS ESPAÑOLAS Y NAVEGACIÓN AÉREA)
- **Design**: ESTUDIO LAMELA ARQUITECTOS
- **Construction**: FCC (FOMENTO CONSTRUCCIONES Y CONTRATAS)
- **Facade Manufacturer**: GRUPO FOLCRA EDIFICACIÓN

**WAVES GRAND SUD SHOPPING CENTRE (METZ-FRANCE)**

- **Ownership**: COMPAGNIE DE PHALSBOURG - LES ARCHES MÉTROPOLE
- **Design**: GIANNI RANAULO - LIGHT ARCHITECTURE
- **Construction**: COMPAGNIE DE PHALSBOURG - LES ARCHES MÉTROPOLE
- **Facade Manufacturer**: ACIEROID (2014)
## Clients and Partners

<table>
<thead>
<tr>
<th>ACIEROID</th>
<th>EUROPERFIL</th>
<th>INBOBE</th>
<th>STOBAG IBERIA</th>
</tr>
</thead>
<tbody>
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