

NAME : FUNDACIÓN ITMA

INSTITUTION : FUNDACIÓN ITMA

COUNTRY : SPAIN

Profile:

Fundación ITMA is a nonprofit and private foundation which aims to promote companies' innovation through applied research and technological development in the field of materials science. ITMA manages two centers with nearly 7.000m², 4.600m² of which are dedicated to laboratories and has a total staff of 109 people comprising Ph.D. (17), higher education graduates (41), technical staff (6) and laboratory assistants and auxiliaries (45). Research performed in ITMA is fully multidisciplinary and targets at the following strategic sectors: Steel & Metallurgy, Ceramic, Refractories, & Raw Materials, Energy, Optics and Electronics, Engineering and Technological Services.

Fundación ITMA participates in numerous collaborative projects at regional, national and European level, coordinating some of them.

Activities:

- Research and development towards the development of innovative materials and processes in areas of specialization where ITMA provides reference capabilities nationally and internationally, thus becoming a strategic partner of targeted industries.
- Development of new materials, products and processes.
- Technological Services such as Structural Integrity, Chemical Analysis, Metrology
- Training: ITMA provides customized training courses on materials science to help meet the educational needs of academia and industry. In collaboration with other entities ITMA also organizes specialised masters i.e European Welding Engineer and Masters in Materials Science and Engineering, as well as conferences and workshops (both internal and external) regarding new trends in materials science and novel processing technologies.

Expertise on following materials:

- Metals and alloys.
- Steels.
- Advanced Ceramics.
- Cements and Refractory Materials.
- Biomaterials.
- Nanomaterials.

Actual research domains concerning materials technology / Competences :

- Ceramics, Refractories & Raw Materials Department:

- Raw materials treatment and conditioning.
- Production of shaped and unshaped (castable) refractories.
- Production of Ceramics, specially Technical Ceramics
- Design and evaluation of thermal processing: drying, tempering and sintering.
- Design and modeling of ceramic components.
- Design and modeling of refractory linings.
- Waste and by-product valorization.

- Steel & Metallurgy Department:

- Welding joints evaluation.
- Weldability studies.
- Design of new alloys
- Mechanical testing, fracture mechanics.
- Structural studies
- Analysis, design and simulation of thermal and thermomechanical treatments
- Electrochemical testing and cabinet corrosion testing.

- Energy Department:

- Physical vapour deposition.
- Chemical vapour deposition.
- Characterization of thin films.
- Study and characterization of new substrates.
- Study and characterization of new interconnect configurations.
- Characterization of electrical efficiency.

- Optics & Electronics Department:

- Digital holography.
- Analog holography.
- 3D Scanning.
- Picture 360 °.
- Machine Vision.
- Embedded Electronics.
- Hardware-In-the Loop.

- Engineering Department:

- Structural Analysis (linear & non-linear): static, dynamic, fatigue, buckling.
- Thermal Analysis: stationary and transient.
- Coupled Analysis: thermo-structural, acoustic
- CFD Analysis: particle drag, multiphase flow, non-Newtonian fluid, contamination, heat transfer, turbulence.
- Process simulation: lamination, stamping, welding, bending & stretching.

- Technological Services Department:

Structural Integrity:

- Welding and joining techniques and characterization.
- Mechanical characterization and microstructural of metal components and their welded joints.
- Approval of welding procedures and welders: realization of WPS, PQR, WPQ.
- Special tests on welded joints: Disbonding, drop weight for nuclear industry.
- Studies of complex materials weldability.
- Evaluation of diffusible hydrogen in metallic materials.
- Containment barriers tests of vehicles.
- Mechanization of test devices.
- Accredited testing.

Chemical Analysis:

- Steel and alloys chemical analysis.
- Ceramic chemical analysis.
- In situ chemical analysis.
- Positive materials identification.
- Accredited analysis.

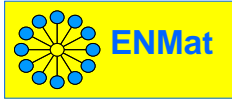
Metrology:

- Metrological management.
- Calibration of measuring instruments.
- Mass / Electrical / Temperature / Pressure.
- Accredited calibrations.

Available research infrastructure :

Some of the main equipments available at Fundación ITMA are listed below:

- Refractories workshop.
- Ovens and High temperature furnaces for thermal treatment under controlled atmosphere.
- Spray-dryers.
- Rotary furnace for corrosion testing of melts and slags
- Hydraulic press (120 tons).
- Isostatic press (6000 bar).
- 5 axis machining center.
- Structured white light scanners.
- Laser High consistency.
- Automatic Processing holographic film.
- Automatic digital holographic shots.
- Electronics Laboratory.
- AUTODESK-Inventor, Pro/ENGINEER.
- ANSYS-CFX.
- DELL PRECISION R5500 Workstations:
 - 2 Intel® Xeon® Processor X5650 (12 MB Cache, 2.66Ghz, 6.4GT/s).
 - 1 Hard Drive: 146GB 15000 rpm (system).
 - 3 Additional Hard Drive: 438 GB 15000 rpm.
 - 48 GB 1333MHz DDR3 ECC RDIMM 64 Bit OS.
- Metals workshop.(Saws, cutters, lathes,...).
- Equipment for chemical analysis of metals and refractory.
- Metrological verification teams. (dimensional, pressure, temperature, sound...).
- Disbonding.
- Impact test machine by drop weight to the nuclear sector.
- Structured white light scanners.
- Laser High consistency.
- Automatic Processing holographic film.
- Automatic digital holographic shots.
- Electronics Laboratory.
- PVD. Physical vapor deposition. For thin film deposition.
- CVD. Plasma-enhanced chemical vapor deposition. For thin film deposition.
- Thermal CVD. Thermal chemical vapor deposition. For the synthesis of carbon nanotubes and graphene.
- Equipment for thin film characterization.
- Melting pilot plant (Vacuum & air casting).
- Welding pilot plant.
- Dilatometers.
- Multi axial rig for mechanical testing.



European Network of Materials Research Centres

- Metallographic laboratory.
- Optic and electronic microscopy laboratories.
- Corrosion and electrochemical laboratory.
- Corrosion cabinet laboratory.
- In-process corrosion simulator.

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