



European Network of Materials Research Centres

NAME : MATERIAL TECHNICAL RESEARCH UNIT

INSTITUTION : AIDICO (TECHNOLOGICAL CONSTRUCTION INSTITUTE)

COUNTRY : SPAIN

Profile: AIDICO is the private and non-profit Spanish Construction Technology Institute with 150 specialised employees. It is formed by more than 400 industrial associated companies involved in the construction process. It was founded by governmental and industrial representatives to increase the businesses' potentials for innovation, quality and competitiveness. AIDICO is active in different construction related activities working very close to the industry: materials, IST, quality assurance, risk and safety management, data and process modelling, knowledge Management, etc.

AIDICO has been the co-ordinator of the network proDAEC VFP project (which data exchange models are a basis for the project), belonging to the E-CORE net "European Construction Research Network", the net OSNET (The Ornamental Stone Network) and participates in the FP VI IP projects: "Intelligent Cities – INTELCITIES", and i-STONE "Integrated Natural Stone Production and Manufacturing".

At this moment AIDICO is coordinating the Spanish Network RENAC, for the application of Nanotechnology in construction and Habitat Products.

The scientific personnel from the Nanomaterials Division (7 Chemist PhD, 1 Physics PhD, 1 Geologist PhD, 5 Chemist MPhil, 2 Industrial Engineers) work from basic to applied research in order to develop innovative multifunctional construction products based on Nanomaterials.

Activities :

Research and development activities in the field of advanced materials development with the aim of transferring results to the industries involved in the Construction sector (cement, concrete, mortar, stone, paints) that demands multifunctional high added value products. The interdisciplinary team (chemists, physics, geologists, materials engineers..) works from basic to applied research in different fields: properties, structure, processing, modelling, industrial scale-up..)

Service providing to the industry : offering a performant research infrastructure and research logistics, including scientific services; characterization of construction materials, technological observatory, calibration and automation, information and documentation, technology transfer in general.

Training in the field of materials science: general training activities for the industrial technician personnel but also specialised in the organisation of workshops and conferences with regard to modern developments in materials science.



Expertise on following materials:

- Nanocomposites from thermosetting polymers.
- Inorganic oxide nanoparticles obtained by sol-gel.
- Thin coating materials.
- Cement based materials: mortar and concrete
- Agglomerated artificial stone.
- Thermosetting polymers.
- Puzzolana cement additions.
- Paints
- Ceramic coatings.
- Stone materials

Actual research domains concerning materials technology / Competences :

Nanomaterials and intelligent materials

- Synthesis of organoclays (organic electrostatic and covalent modifications of the clay sheets).
- Development of thermosetting polymer nanocomposites from different procedures with application as multifunctional coatings: self-cleaning, transparent, fire retardant, high tribological properties.
- Synthesis of “tailor made” nanoparticles for cement and polymer matrix modification.
- Structural characterization with AFM, SEM, TEM technologies.
- Nanoindentation technique for tribological characterization.
- Controlled liberation of active substances for corrosion prevention.
- Synthesis of thermochromic and photochromic nanomaterials.
- Chemical optical sensors.

Advanced cement based construction materials

- Enhancement of cement derived materials
- Enhancement of gypsum and plaster derived materials
- Development of new cements

Reduction of the environmental impact of the construction industry

- Recycling of the wastes generated by the construction industry
- Decrease in the generation of wastes in production processes
- Use of sub-products from other industrial sectors as raw materials
- Reduced energy consumption in the industry and in buildings

Ornamental rocks, aggregates, cements, gypsums and limes for construction

- Assessment and characterization systems for ornamental rocks
- Durability tests for ornamental rocks
- Improvement of the mechanical properties of ornamental rocks

Non destructive Measurements and tests of construction materials

- Wave-based, non-destructive tests for the assessment of materials



- Thermal and acoustical characterization of materials.
- Development of new laboratory testing methods
- Tests for the assessment of building and construction systems conditions

Technologies for the production of construction materials

Development of pilot plants to reproduce the production process of materials
New manufacturing systems
Waste recycling systems

Available research infrastructure :

- Nanoindenter XP.
- Atomic Force Microscopy XE-150 .
- X Ray Diffractometer D8-Advance.
- Gas Porosimeter ASAP2020 .
- Mercury Porosimeter AUTOPORE
- Reómetro AG2000 .
- Thermogravimetric analyzer TGA850/SDTA
- Potentiostat-Galvanostat PGSTAT 302 with impedance modulus from AUTOLAB
- Spin Coating model G3P12 from Cookson Electronics Equipment.
- ATR-FT-IR Spectrometer,
- Vacuum oven.
- Optical microscopy of polarization with reflected and transmitted light.
- Instron press.
- Climatic chamber quv.
- Viscosimeter
- Laser Granulometry-Malvern
- Calorimeter Mettler Toledo, modelo 822
- Dinamo mechanical analyzer DMA mod. SDTA861°

Coordinate address : Avda. Benjamin Franklin 17
Parque Tecnológico de Paterna
46980 Paterna, Valencia
SPAIN

URL : www.aidico.es

Contact persons :

Name :	Dr. María José López-Tendero	Dr. Angel López Buendía
Function :	Nanomaterials Coordinator	Research Director
Tel. :	+34 96 131 82 78	+34 96 131 82 78
Fax :	+ 34 96 131 80 33	+ 34 96 131 80 33
e-mail :	mlopezt@aidico.es	angel.lopez@aidico.es