TECHNOLOGICAL CENTRE LUREDERRA

Lurederra
centro tecnológico

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Área Industrial "Perguita", Calle A, nº 1 31210 - Los Arcos (Navarra-España)

Lurederra in brief

L'Urederra Foundation, **non-profit private entity created in June 1999**, conducts and promotes research and technological development activities in the service of companies and economic operators, including the subsequent implementation of innovations developed in their own production facilities not only nationally but also internationally.

EVOLUTION

INSTALLATIONS:

- Year 2011: Own headquarters of 5.500 m2 (2.500 m2 built)
- Year 2013: Expansion of Industrial Unit rented in Los Arcos (+900 m2)
- Year 2016: Expansion of Industrial Unit, own adquisition, in Los Arcos 2.230 m^2

CURRENTLY IN TOTAL: **8.630 m^2 (4.530 m^2 built)**

PERSONNEL:

- October 2000: 4 people
- 2025: 35 people

Industrial vision:

Continuous development of marketable products and technologies quickly transferable and exploitable.

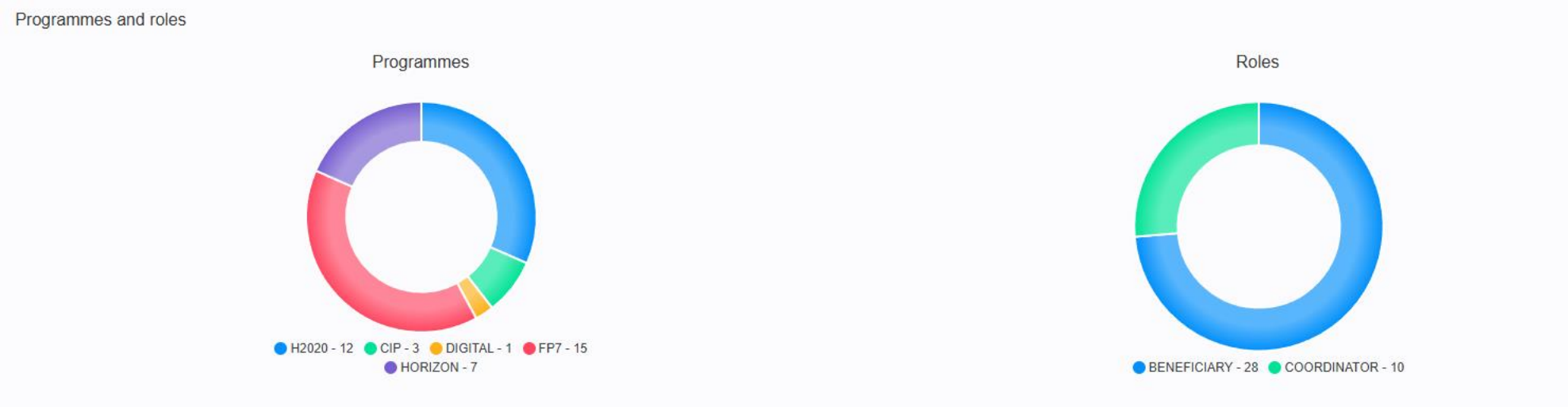
Main activities and strategy

- Internal research activities for the development of technologies and products: RESEARCH FOR EXPLOITATION, diverse active formulations are becoming market products by the sale or transference of technology: AQUASHIELD, TECNADIS PRS PERFORMANCE, TECNADIS GWR, TECNADIS METALCOAT, TECNADIS SELFCLEAN PV, TECNADIS MULTICOAT, TECNADIS COATEX, recycled PVB, special nanocoatings, new products based on sophisticated nanoparticles, etc.
- Participation and coordination in collaborative projects at national and international level: implying cutting-edge technologies to be rentabilised in the near future.
    - RTD Projects of large scope: 400 (Under contract/technology acquisition)
    - International Projects, EU Framework Programme: 34 (Coordinator of 10) – one of the most active agents in Navarre.
    - LIFE/ CIP International Projects: 12 (Coordinator of 12)
    - International Patents published: 3 completed
    - National and International recognition as a Technological Centre with high experience in Nanotechnology
- RTD developments with private companies
- Investment in new commercialisation routes, creation of Spin-off companies: The concept of technological centre transformed into "production entity". First case in 2007, Tecnología Navarra de Nanoproductos S.L. (*TECNAN) production and commercialisation of nanoproducts at industrial scale*

TECNAN
TECNOLOGÍA NAVARRA DE NANOPRODUCTOS, S.L.

"Think Big, Act Nano"

https://tecnan-nanomat.es/



Horizon Europe

SUSAAN “SUStainable Antimicrobial and Antiviral Nanocoating” HORIZON-CL4-2021-101057988 **COORDINATOR**

FREE4LIB “Feasible recovery of critical raw materials through a new circular ecosystem for a Li-ion battery cross-value chain in Europe” HORIZON-CL5-2021-101069890

Platform-ZERO “Customizable AI-based in-line process monitoring platform for achieving zero-defect manufacturing in the PV industry” HORIZON-CL4-2021-101058459

SUNRISE “Safe and sUstainable by desigN: integRated approaches for Impact aSsessment of advanced matErials” HORIZON-CL4-2023-RESILIENCE-101137324

SOLINDARITY “SOLar-driven INDustrial power And heat upgRaded with hIgh-temperature heaT pumps for enhanced integrated process efficiencY” HORIZON-CL5-2023-D3-101136148

BEETHOVEN “SUBSTITUTION OF RARE-EARTHS FOR ADVANCED NOVEL MAGNETS IN ENERGY AND TRANSPORT APPLICATIONS” HORIZON-CL4-2023-RESILIENCE-101129912

NEOCYCLE “UPCYCLING OF NdFeB MAGNETS IN THE EU FOR GREEN APPLICATIONS (NEO-CYCLE)” HORIZON-CL4-2023-TWIN-TRANSITION-01-101138058

IV FRAMEWORK PROGRAMME

1.- INNOREGIO: Support to Innovation Management and competitivity in the European Regions. RECITE II _ Subcontractor

2.- ECOSITES: Industrial production of high-performance ecological polymeric composites based on residual/renewable cellulose fibres and post-consumer thermoplastics G5RD-CT2000-00337 _ Subcontractor

V FRAMEWORK PROGRAMME

1.- ABSORB: Novel Absorbent for Heavy Oil Clean-Up G5ST-CT2002-50295_ Partner

2.- SEQUEF: Spectrographic quality evaluation of fruits and vegetables G6ST-CT2002-50376_ Partner

VI FRAMEWORK PROGRAMME

1.- PURILEACH: Modular purification system for heavily polluted leachate. COOP-CT2004-508698_ **Coordinator**

2.- NANORUB: Customised nanocomposites based on rubber matrices for high demand aplications. COOP-CT2005-018003_ **Coordinator**

3.- FLARETPOL: Development of an innovative, cost-effective technology to produce halogen-free, high-performance flame retarded polyolefins. NMP3-CT2005-516998_ Partner

4.- RECFINMIX: Primary recycling of polyolefin-mixed films for high-added value applications within the blow-moulding industry COOP-CT2006-032766_ **Coordinator**

VII FRAMEWORK PROGRAMME

1.- **SORBENT:** Soil remediation technique for in situ cleaning of soils contaminated with heavy hydrocarbons mixtures. SME-2008-232533_ Partner

2.- **NANOPOLYTOX:** Toxicological impact of nanomaterials derived from processing, weathering and recycling of polymer nanocomposites used in various industrial applications. NMP-ENV-2009-247899_ Partner

3.- **ADVANCE-FSP:** Large scale production of tailored nano-oxides by advanced high-output, high versality flame spray pyrolysis" NMP3-SL-2009-228885_ **Coordinator.**

4.- **MANANO**: Manufacturing and applications of nanostructured materials. PEOPLE-2010-264710_ Partner.

5.- **BioSURFEST:** Development of novel environmentally added-value surfactants and esters by biotechnological processes from fats and oils waste streams. SME-2011-286834_ Partner.

6.- **NEXTGENCAT:** Development of NEXT GENeration cost efficient automotive CATalysts. SMP3-SL-2011-280890_ Partner.

7.- **ArtipHyction:** Fully artificial photo-electrochemical device for low temperature hydrogen production. FCH-JU-2011-303435_ Partner.

8.- **ECONANOSORB:** Ecological application of nanosorbents on the base of natural and synthetic ionites and carbons. PIRSES-GA-2011-295260_ **Coordinator.**

9.- **STABLE:** STable high-capacity lithium-Air Batteries with Long cycle life for Electric cars. FP7-2012-GC-MATERIALS-314508_ Partner.

10.- **RECYVAL-NANO:** Development of recovery processes for recycling of valuable components from FPDs (In, Y, Nd) for the production of high added value NPs. NMP2-SE-2012-310312_ **Coordinator**

11.- **NATURAL:** Standardised metrology of Nano-sTrUctuRed CoAtings with Low surface energy. NMP4-SE-2013-310397_ Partner

12.- **WELDAPRIME:** Self-repairable Zinc-free Weldable Anti-corrosion Primer for the Steel protection. FP7-SME-AG-2013-605371_ Partner

13.- **SORBENT-DEMO:** Demonstration of soil remediation technique for in situ cleaning of soils contaminated with heavy hydrocarbon mixtures. FP7-SME-CP-605607_ Partner

14.- **HIPOCRATES:** Self-healing polymers for concepts on self-repaired aeronautical composites. FP7-AAT-2013-RTD-1-605412_ Partner

15.- **WOODFLARETCOAT:** Flame-retardant coatings based on nano-magnesium hydroxide, huntite and hydromagnesite for wood applications. FP7-SME-AG-2012-315425 **Coordinator**

HORIZON 2020

1.- INFINITY: Indium-free transparent conducting oxides for glass and plastic substrates. H2020-SC5-2014-641927 _ Partner

2.- PARTIAL-PGMs: Development of novel, high Performance hybrid TWV/GPF Automotive afteR treatment systems by raTIonAl design: substitution of PGMs and Rare earth materials. H2020-NMP-2015-686086 _ Partner

3.- INNOVIP: Innovative multi-functional Vacuum-Insulation-Panels (VIPs) for use in the building sector. H2020-EEB-2016- 723441 _ Partner

4.- AFTERLIFE: Advanced Filtration TEchnologies for the Recovery and Later conversIon of relevant Fractions from wastewater. H2020-BBi-JTI-2016-745737 _ Partner

5.- MARKETPLACE: Materials Modelling Marketplace for Increased Industrial Innovation. H2020-NMBP-2017-760173 _ Partner

6.- SUPER-PV: CoSt redUction and enhanced PERformance of PV systems. H2020-LCE-10-2017-792245 _ Partner

7.- ZEOCAT-3D: Development of a bifunctional hierarchically structured zeolite based nano-catalyst using 3D-technology for direct conversion of methane into aromatic hydrocarbons via methane dehydroaromatization. H2020-NMBP-24-2018-814548 _ Partner

8.- ION4RAW: Ionometallurgy of primary sources for an enhanced raw materials recovery. H2020-SC5-2018-2-815748_ Partner

9.- NANOSTACKS: Nanostack printing for materials research. H2020-EIC-FETPROACT-2019-951949_ Partner

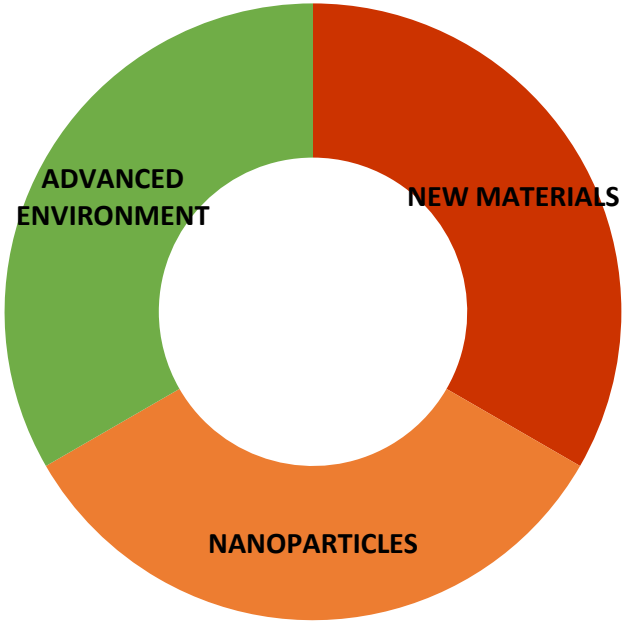
10.- WASTE2FRESH: Smart innovative system for recycling wastewater and creating closed loops in textile manufacturing industrial processes" H2020-SPIRE-2020-958491_ Partner

11.- MAREWIND: MAterials solutions for cost Reduction and Extended service life on WIND off-shore facilities. H2020-NMBP-2020-952960 _ **Coordinator**

12.- SUNRISE: MultiSensor sorting tools in a circular economy approach for the efficient recycling of PVB interlayer material in high-quality prodUcts from laminated glass coNstRuction and demolItion waStEs. H2020-LCCI-2020-958243. _ **Coordinator**

LUREDERRA RTD AREAS

- Wastewater Treatment
- Revalorisation of organic wastes
- Metal decontamination and metal recycling from wastes
- Nanoparticles applied to environment
- Absorbents for removal and recovery pollutants



- Advanced materials development (functionalised)
- Plastic processing technologies.
- Plastics recycling
- Materials for construction with special properties

- Advanced nanoparticle production: simple and complex (mixed, doped, core-shell) nanooxides, phosphates and carbonates.
- Production of customised nanoparticle dispersions in different concentrations with high stability.
- Ready-to-use nanoproducts.
- Specific surface treatments
- Synthesis of specific functional compounds.
- Synthesis and modification of nanoclays.

NANOPARTICLES AND NANOTECHNOLOGY

TAILORED SYNTHESIS OF NANOPARTICLES AND NANODISPERSIONS:

- **Flame Spray Pyrolisis production technology:**
  - Wide range of nanomaterials: single, doped, multi-component
  - Control of particle properties: Small sizes (7-25 nm)
  - Short process chain and automation
  - High thermal stability and purity
  - Scalability up to kilograms/hour

- **Dispersion technology / chemical functionalisation:** (ultrasonic forces, milling deagglomeration techniques)
  - Laboratory scale reactors (1-20 litres)
  - Pilot scale reactors (50-1000 litres)
  - Dispersion lines at lab scale (30L/h) and pilot scale (100L/h)
  - Wet milling lines
- **Thermal treatments**
  - Inert and Reduction ovens: H_2 (0-100%) (up to 2.000 ºC)
  - Continuous thermal oven (up to 1.000 ºC)

FSP Configurations	Advanced nanomaterials
Standard	**Simple and mixed oxides, phosphates HEOs, noble metals**
Ring deposition	**Core-shells**
Double-Nozzle & Sequential deposition	**Well distributed supported materials**
O2 lean/Reductant atmosphere	**Oxygen vacancies in oxides Non-oxides: metals, carbon doping, metal-sulphides and oxynitrides**
Thin-film deposition	**Nanoporous thin films for electrodes**

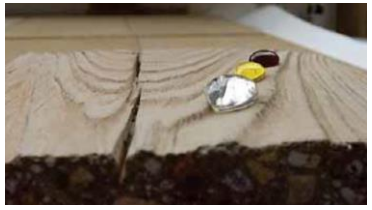
Different FSP configurations enable the tailoring of the materials

NANOPARTICLES AND NANOTECHNOLOGY

NANOSURFACE TREATMENT / NANOENABLE MATERIALS / COATINGS:

Different properties on different substrates (*stone, gypsum, wood, mortar, glass, metal, epoxy, textile, plastics):*

- Hydrophobicity/Oleophobicity
- Anti-stick/Easy-to-clean/Antifouling
- Anticorrosion
- Anti-bacterial/virucide
- Hardness
- Photocatalysis
- Infrared radiation barrier
- Aesthetic effects ….



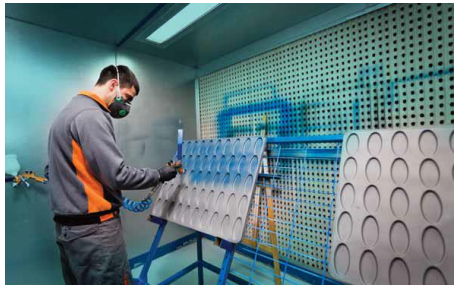

PILOT APPLICATIONS ON SITE AND FINISHED REAL PRODUCTS

Manual on-site applications

Automated coating line for pipelines


Motoman MH6 Robot

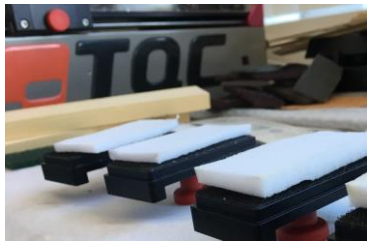
Spray booth and curing oven

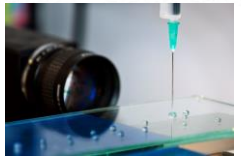



NANOPARTICLES AND NANOTECHNOLOGY

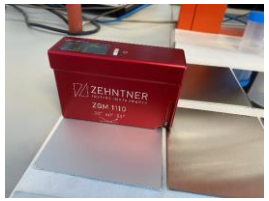
COATINGS CHARACTERISATION

- Contact angle – goniometry ISO 15989:2004
- Cross cut – adherence ISO 2409:2007
- Roughness
- Thickness
- Hardness: Shore C and Pencil test ISO 15184:2012.
- Glossmeter (triple angle 20º, 60º and 85º)
- Transmittance
- Exposure to specific raditation: IR light and solar spectrum.
- Abrasimeter (dry/wet scrub) – durability ISO 11998
- Saline mist chamber
- UV ageing
- Antimicrobial activity (ISO 22196)
- Anticorrosion by LSV and EIS

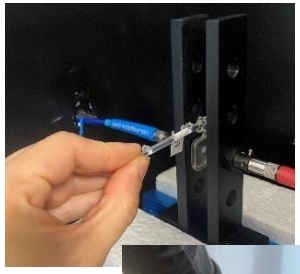


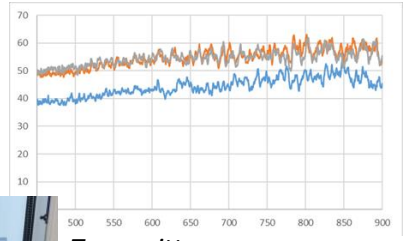


Contact angle



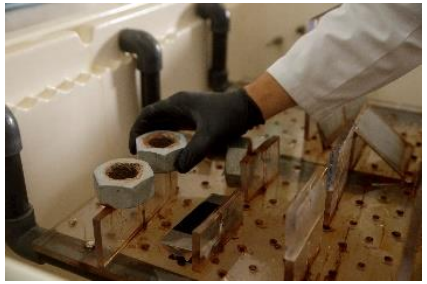
Glossmeter





Transmittance

Potenciostat



Saline mist chamber

UV ageing

Microbiology

ADVANCED ENVIRONMENT

WASTE WATER TREATMENT

- Innovative materials for pollutants removal (hydrocarbons, FOGs, heavy metals, PPCPs) and waste water treatment:
  - Elastomeric material for removal of fats, oils, grease and hydrocarbons in contaminated waters.
  - Novel absorbents and nanoresins for metals removal and organic pollutants.
  - Functionalised clays.
  - Nanoparticles: simple or mixed oxides (FeO, MnO_2, doped TiO_2…) for adsorption or photocatalytic effect.
- Facilities for testing: Modular Waste Water Treatment Plant for physical-chemical treatment of variable polluted waters: coagulation-flocculation module, advanced oxidation process, filtration module and decanter (0,5-2 m^3/h capacity).





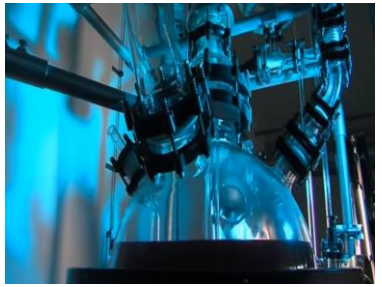


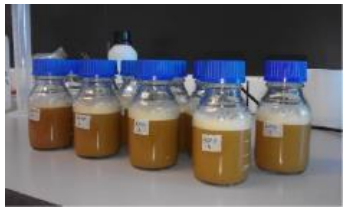

ADVANCED ENVIRONMENT

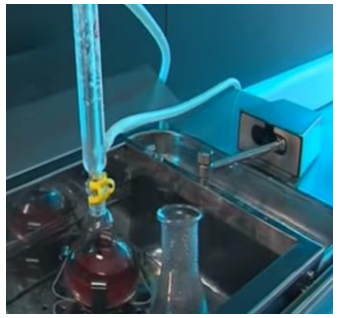
RECYCLING AND WASTES VALORIZATION:

- Materials and metal recycling from WEEEs: Leaching, solvent extraction and precipitation technologies for recovery of precious metals, rare earths and Critical Raw Materials.

- Extraction of added value chemicals from agro industrial-wastes: mild processing techniques of milling, extraction, concentration and purification of bioactive compounds.







NEW MATERIALS

PLASTICS PROCESSING AND FUNCTIONALISATION:

- Additivation of plastics and paints, functionalisation and modification of nanocharges (nanoclays and nanoparticles)
- Plastics processing capabilities
  - Rollers, hot and cold plates press
  - Single and double screw extrusion (20 kg/h)
  - Injection and moulding (60 Tn)
  - Blown extrusion

PLASTICS RECYCLING:

- Recycling solutions for end-of life plastic (single and mixed plastics)
  - Chemical recycling
  - Pilot line for PVB recycling from laminated glass
  - Pilot line for polyolefins separation
  - Pyrolysis equipment and distillation reactor for plastic pyrolysis and fraction separation

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