A non-profit R&D institution based in Madrid, specialized in high-performance fibres and sheets of 1D nanomaterials, looks for R&D partners for the topic HORIZON-CL4-2025-03-MATERIALS-47

Summary

Profile type	Company's country	POD reference
Technology offer	**Spain**	**TOES20250618005**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Research and development cooperation agreement**	**• World**
Contact Person	**Term of validity**	**Last update**
Enrico FRANZIN	**18 Jun 2025** **18 Jun 2026**	**19 Jun 2025**

General Information

Short summary

A non-profit R&D institution based in southern Madrid (Spain) specializes in the development of multifunctional materials (fibres, yarns, sheets) made of 1D nanostructures (CNTs, inorganic nanowires). The only EU-based centre producing sustainable 1D nanomaterials at gram-per-day scale through scalable gas-phase synthesis for usage in batteries, capacitors, electrical conductors, sensing, etc. Research and development cooperation is sought, mainly in Europe, the US, Japan, and South Korea.

Full description

Located in Madrid (Spain), IMDEA Materials excels in advanced materials research and engineering. It hosts one of Europe's largest silicon nanowire production facilities and can assemble these 1D nanostructures into macroscopic sheets ideal for energy-storage applications—offering higher capacity and improved mechanical performance compared to conventional graphite electrodes.
The Institute is also unique in the EU for its gas-phase synthesis of carbon nanotube (CNT) macromaterials—fibres, yarns and sheets—with high aspect ratios. Equipped with multiple dedicated reactors, it delivers in-depth synthesis analysis and scalable production. These CNT macromaterials integrate seamlessly with high-performance polymers (PEEK, PAEK, PEI, etc.) and can be processed into composites via 3D FFF printing or automated fibre/tape placement. They exhibit exceptional electrical and thermal conductivity, mechanical strength, fracture toughness,

flexibility and recyclability from both thermoset and thermoplastic laminates, with near-complete retention of alignment and properties.
IMDEA Materials combines decades of expertise in materials synthesis (gas- and liquid-phase routes), multiscale characterization and post-treatment for applications ranging from aerospace to biomedical devices. Its strong record includes peer-reviewed publications, patents and international collaborations with public and private partners.
Seeking to expand the impact of its nanomaterials, IMDEA Materials invites international collaborators to explore domain-specific applications—such as energy storage, sensing and electromagnetic shielding—and to pursue joint funding under European and global programs. Collaborative efforts may encompass prototype development, performance testing and technology scaling in relevant operational environments.

Advantages and innovations

• Scalable synthesis of one-dimensional nanomaterials (e.g., silicon nanowires, carbon nanotubes) at gram-per-day rates.
• Production and post-processing of macroscopic formats (fibers, yarns, textiles, sheets, composites) to explore the high-performance properties and multifunctionality.
• Compatibility with high-performance matrices, existing industrial processes and device architectures.
• Tailored material formulations enabling application-specific properties such as high electrical conductivity, or mechanical strength.
• Multidisciplinary know-how across synthesis, self-assembly, structural design, post-treatments, and recycling, allowing rapid prototyping and adaptation.
• Expertise in transition from lab-scale discovery to pilot-scale production.
• Competitive sustainable alternative to conventional materials such as graphite in battery anodes, or high-performance fibres.

Technical specification or expertise sought

Stage of development

Lab tested

Sustainable Development goals

- **Goal 7: Affordable and Clean Energy**
- **Goal 9: Industry, Innovation and Infrastructure**

IPR Status

Secret know-how

IPR Notes

Partner Sought

Expected role of the partner

Private and public R&D partners for upcoming or future calls within Horizon Europe, such as Innovative Advanced Materials (IAMs) for conformable, flexible or stretchable electronics (RIA) (Innovative Advanced Materials for Europe partnership), or other international, European and national ones.

Type of partnership

Research and development cooperation agreement

Type and size of the partner

- **University**
- **Big company**
- **R&D Institution**
- **SME 11-49**
- **Other**
- **SME 50 - 249**
- **SME <=10**

Dissemination

Technology keywords

- **04007001 - Energy management**
- **03005007 - Textile fibres**
- **02007024 - Nanomaterials**

Market keywords

- **03002 - Batteries**
- **08001004 - Fibre-reinforced (plastic) composites**

Targeted countries

- **World**

Sector groups involved

- **Energy-Intensive Industries - Materials**