A Spanish SME developing nanostructured coatings with ultrapure nanoparticles for advanced surface applications in sensing, energy, aerospace and biomedicine is looking for consortia to apply to EDF calls for proposals

Summary

Profile type	Company's country	POD reference
Technology offer	**Spain**	**TOES20250702018**
Profile status	**Type of partnership**	**Targeted countries**
PUBLISHED	**Commercial agreement with technical assistance** **Research and development cooperation agreement**	**• World**
Contact Person	**Term of validity**	**Last update**
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General Information

Short summary

A Spanish SME based in Madrid develops advanced nanostructured coatings with ultrapure nanoparticles to improve surface properties in aerospace, energy, sensors and biomedical devices. They are looking to join consortia preparing proposals for the European Defence Fund calls. Their ideal partners are device manufacturers (SMEs, Corporate, R&D institutes) that require advanced coatings to enhance material properties, such as producers of satellites, sensors, electrodes, implants, or prostheses.

Full description

A SME based in Southern Europe, active in the field of nanotechnology and advanced materials, is offering a technology platform for the development and integration of nanostructured coatings composed of ultrapure nanoparticles. It specialises in the synthesis and application of highly controlled nanomaterials for surface functionalisation in critical applications across multiple sectors.

The proposed technology addresses the increasing demand for high-performance, multifunctional surfaces in sectors where durability, safety, and functionality are essential. In particular, industrial and defence applications increasingly

require surfaces that are resistant to wear, corrosion, contamination, or biofouling, while also enhancing key properties such as conductivity, optical transparency, biocompatibility, or hydrophobicity. Current solutions typically rely on conventional coatings that lack nanoscale precision, may contain hazardous substances, or are not easily adaptable to complex geometries or multi-material systems.

This nanotechnology-based solution enables the deposition of coatings with nanometric thickness and excellent control over composition and morphology. These coatings are suitable for various substrates and geometries and can be customised to meet the performance needs of end-use components. The coating technology has several application fields already under development within R&D collaborations:

-Aerospace and defence systems, where coatings are applied to radiofrequency (RF) devices (e.g. satellite waveguides) to protect them from powerful radiation.

-Energy, including coatings for electrodes in electrolyzers, batteries, capacitors, and fuel cells, aiming to improve efficiency and stability.

-Sensors and biosensors, where coatings improve sensitivity, selectivity, and environmental resistance.

-Biomedical technologies, such as coatings for implants and prostheses to inhibit bacterial adhesion and enhance biocompatibility.

The technology is being offered as part of an initiative to join a European Defence Fund (EDF) consortium. The EDF supports collaborative defence R&D projects among European stakeholders and focuses on strengthening the EU's strategic autonomy in critical technologies. The participation of this SME in an EDF consortium would contribute cutting-edge know-how in nanoparticle synthesis and coating formulation, as well as experience in adapting nanostructured materials to industrial requirements.

The SME has experience in 10 national and 1 international R&D projects and maintains collaborations with research organisations and industrial actors. Its core team includes scientific and technical personnel with expertise in materials science, surface engineering, and nanomanufacturing.
The organisation is seeking to join or co-develop a consortium preparing a proposal for an EDF call expected in Q4 2025. It is open to various forms of collaboration, including:

-Technical cooperation: joint development, testing, and integration of the coatings into specific devices or systems.

-Research cooperation: collaborative activities in surface engineering and performance validation under operating conditions.

-Participation in research consortia: joining multi-partner projects where the SME can contribute its specific know-how and support the adaptation of the technology to defence or dual-use systems.

The desired international cooperation is framed as a strategic partnership in which the SME complements the capabilities of integrators, device manufacturers, or research organisations. This cooperation will allow for joint demonstration of the technology's performance and the co-development of functional prototypes or pre-commercial components.

This offering provides a collaboration opportunity for actors in defence, space, biomedical, or energy domains who are seeking to access innovative coating technologies with potential for customisation, scalability, and integration into demanding applications.

Advantages and innovations

The offered technology is based on a novel physical method for fabricating nanostructured coatings, developed to overcome the typical limitations of current nanoparticle synthesis and deposition techniques. While many companies focus on chemical routes for producing nanoparticles, such approaches often suffer from key drawbacks: surface contamination due to stabilising agents, poor control over particle size and composition, and the generation of chemical waste from solvents and reagents. Physical methods, on the other hand, are often cleaner but struggle to produce homogeneous nanostructures at scale.

This technology introduces a patented methodology based on magnetron sputtering under ultra-high vacuum (UHV) conditions. It enables the direct fabrication and deposition of ultrapure nanoparticles with nanometric precision and uniformity. The process ensures a high degree of control over the morphology, composition, and spatial distribution of the nanoparticles, while eliminating the need for chemical precursors or solvents.

Key features and advantages include:

-Impurity-free nanoparticles, thanks to a clean physical process without surfactants or stabilisers.
-Precise control of particle size, composition, and distribution at the nanoscale.
-No chemical waste, as the method does not involve solvents or hazardous reagents.
-Industrial compatibility, as UHV-based sputtering systems are already widely used in high-tech manufacturing sectors.

This platform represents a significant advancement over conventional nanoparticle synthesis and nanocoating methods. It is particularly well suited for applications requiring extremely clean, functional surfaces such as sensors, biomedical implants, satellite components, and energy devices. The technology is ready for integration into existing production lines and offers scalability for both R&D and industrial environments.

Technical specification or expertise sought

Stage of development

Already on the market

IPR Status

IPR granted

IPR Notes

Sustainable Development goals

- **Goal 9: Industry, Innovation and Infrastructure**

Partner Sought

Expected role of the partner

The organisation is seeking to join established consortia preparing proposals for upcoming calls under the European Defence Fund (EDF). In particular, the company aims to be integrated as a technology contributor in the field of advanced nanostructured coatings for high-performance devices. The SME is not seeking to coordinate the consortium but to support other partners, especially system integrators or manufacturers by offering surface functionalisation technologies that improve the performance, durability, and safety of critical components.

The role envisaged for this partner is to contribute to the development, adaptation, and integration of nanoparticle-based coatings tailored to the functional requirements of specific devices within the project. These may include, but are not limited to:

-Surface treatments for satellite subsystems (e.g. waveguides, housings, connectors) to reduce multipactor effects or improve electromagnetic compatibility.

-Coatings for sensor components or detection systems to enhance sensitivity, chemical resistance, or stability in extreme conditions.

-Nanocoatings for energy-related devices such as electrodes, capacitors, or power electronics for increased efficiency and lifespan.

-Functional surfaces in biomedical or protective equipment for antimicrobial or biocompatible properties.

The main tasks the company can undertake as a consortium partner include:

-Design and synthesis of ultrapure nanoparticles with controlled size, composition, and morphology.

-Development of deposition protocols adapted to partner components and geometries, using patented ultra-high vacuum (UHV) magnetron sputtering methods.

-Functional validation of coated devices, in collaboration with integrators or testing centres.

-Characterisation of coatings (e.g. SEM, XPS, AFM, TEM…) and performance optimisation in operational environments.

-Technical support for integration into existing manufacturing chains and guidance for upscaling.

The SME has experience in collaborative R&D projects at national and European level and is used to working closely with both industrial and research partners. It brings a strong added value to consortia focused on materials, electronics, sensors, protection systems, and energy conversion technologies, especially when surface properties are key to performance.

The client is particularly interested in consortia that already have a coordinator and core industrial members defined, and that are looking for additional technical partners to strengthen the materials and surface engineering aspects of their proposal. The SME is open to joining consortia from different EU member states or associated countries, provided that the thematic focus aligns with defence-related technologies and dual-use applications. The desired partnership would ideally include regular technical interaction with component developers and system integrators, as well as collaboration with research organisations or testing labs for validation. The SME is flexible in terms of participation model and can adapt its contribution according to the needs of the project and the technical work plan.

Type of partnership

Commercial agreement with technical assistance

Research and development cooperation agreement

Type and size of the partner

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

Dissemination

Technology keywords

- **02002002 - Coatings**
- **04001003 - Storage of electricity, batteries**
- **06001024 - Medical Biomaterials**
- **02007024 - Nanomaterials**

Market keywords

- **04017 - Micro- and Nanotechnology related to Biological sciences**
- **01005004 - Microwave and satellite components**
- **05003003 - Surgical implants**
- **03002 - Batteries**
- **01006001 - Defence communications**

Targeted countries

- **World**

Sector groups involved

- **Aerospace and Defence**
- **Electronics**
- **Health**
- **Energy-Intensive Industries**