Open access pilot lines for cost-effective nanocomposites

Specific challenge: The field of nanocomposites materials has witnessed remarkable progress in recent years with many different types of nanocomposites exhibiting radically enhanced properties for a wide range of industrial applications. New manufacturing routes are also emerging, such as in-situ synthesis. The main objective is to develop cost effective and sustainable industrial scale technologies for the production of nanocomposites for specific applications, aiming at the selection, testing and optimisation of materials and process parameters as well as the verification of the nanocomposite performance for a given application in a pilot line setting, representative of operational industrial environments and ready for the start of pilot production as the next step (after the project).

In order to enable SMEs to enter this crucial stage of the research-development-innovation cycle, larger enterprises and/or research and technological organisations are asked to get together in order to provide a coordinated network of pilot line, test and validation services for SMEs in order to prepare for management decisions to progress to the next step of new technology deployment, i.e. installation of industrial pilot lines and enter the commercialisation stage.

Scope: The development of pilot lines: Pilot line development is expected to use an existing pilot line as a basis and may include new methods and/or instrumentation with real time characterization (including high-throughput) for measurement, analysis and operations at the nanoscale to characterise relevant materials properties, e.g. nanofillers dispersion, with improved resolution and/or increased sensitivity, based on novel approaches or novel combinations of approaches.

The operation of the pilot lines – testing and validation include: selection and tailoring of nano-particles/objects having the required interfacial interaction and/or compatibility with the matrix to be utilised in the nanocomposite; selection of a processing technique and optimization of process parameters addressing proper dispersion and distribution of nano-particles or nano-particle aggregates within the matrix; development of quality control and process verification.

Proposals should address a range of industrial applications and involve a number of composite producers, addressing in particular the needs of SMEs active in this sector. Plans for operating the network of pilot lines as well as the individual pilot line facilities after the end of EU financial support should be prepared within the proposal, including business plans for the cooperation with SMEs.

For this topic, proposals should include an outline of the initial exploitation and business plans, which will be developed further in the proposed project.

Wherever possible, proposers could actively seek synergies, including possibilities for funding, with relevant national / regional research and innovation programmes and/or cumulative funding with European Structural and Investment Funds in connection with smart specialisation strategies. For this purpose the tools provided by the Smart Specialization Platform, Eye@RIS3 may be useful[1] The initial exploitation and business plans will address such synergies and/or additional funding. Exploitation plans, outline financial arrangements and any follow-up will be developed further during the project. The results of these activities as well as the envisaged further activities in this respect should be described in the final report of the project.

The implementation of this proposal is intended to start at TRL 4-5, target TRL 6. Implemented as cross-KET activities.

The Commission considers that proposals requesting a contribution from the EU between EUR 5 and 8 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

Expected impact:

- A European eco-system for high TRL testing and validation of nano-composites, affordable and accessible for SMEs, through technical collaboration between RTOs and composite producers and through identification of all critical value chain players for the market introduction of the final product.

- Enabling of investment decisions for market introduction of novel, cost-effective, safe and sustainable nano-enabled products that demonstrate superior performance in terms of multifunctionality and sustainability, e.g. in the packaging, textiles, transport, energy, electronics and construction sectors. This non-exhaustive list does not preclude submission and selection of proposals addressing other sectors.

- Demonstrated scaling-up and increased degree of automation of nanocomposites production lines/processes, leading to higher production volumes,

improved reliability and repeatability of produced nanocomposites and lower production cost; availability of new or significantly improved ""fit for purpose"" tools for integration in those lines;

• Contribution to standardisation in the nano metrology field for fast product and process design.

• Promoting safe-by-design approaches in collaboration with the EU nano-safety cluster and contributing towards the framework of EU nanosafety and regulatory strategies[2].

Type of action: Research & Innovation Actions

[1] http://s3platform.jrc.ec.europa.eu; the relevant Managing Authorities can be found at http://ec.europa.eu/regional_policy/indexes/in_your_country_en.cfm

[2] EU Nano-safety strategy 2015-2020 and NanoReg project

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