Manufacturing and control of nanoporous materials

**Specific challenge:** There is a constantly growing interest in nanostructured porous materials, thanks to the many applications that can benefit from controlled porosity at the nanoscale. Nanoporous materials can have many kinds of pore geometries, structures and chemical compositions and possess unique surface, structural, and bulk properties that underline their important uses in various fields. While various methods are available for creating nanoporous materials in a laboratory environment, scaling-up and meeting the industrial demands in terms of quality and costs remain a challenge.

**Scope:** Proposals should address the development and demonstration in relevant industrial environments of reliable processes control and manufacturing routes, to obtain nanoporous materials with controlled porosity distribution or gradient aiming at improved mechanical properties, reliable permeation rate, different electrical properties, anti-fouling or other bio-, photo- or thermo-chemical/physical properties.

Proposals should demonstrate the effectiveness of the developed approaches and technologies, through a pilot line aimed at the production of semi-finished products. The process and the material proposed should support and reflect developing guidance and standards relating to nanomaterials aspects.

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:

• Supporting European competitiveness through accelerated market uptake of nanoporous materials in one or more of the following application fields: transport; energy; construction and building; biomedical; catalysis; sensors; filtration, purification and chromatography; This non-exhaustive list does not preclude submission and selection of proposals addressing other application fields;

• Improvement in cost-effectiveness and sustainability of nanoporous materials with a verified market viability of the pilot line;

• New market opportunities through introduction of novel products enabled by nanoporous materials;

• Demonstrated scaling-up of production of nanoporous materials, leading to higher production volumes, improved reliability and repeatability of products with lower production cost;

• Improvement in technical knowledge concerning manufacturing processes of nanoporous structuring of materials with innovative methods and solutions.

• Contribution to on-going and future standardisation work in the field[2]

• Promoting safe-by-design approaches in collaboration with the EU nanosafety cluster and contributing towards the framework of EU nanosafety and regulatory strategies[3].
Type of action: Innovation Actions


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