

Austrian SME developing innovative antimicrobial multifunctional composites is looking for partners for product development

Summary

Profile type	Company's country	POD reference
Research & Development Request	Austria	RDRAT20220811006
Profile status	Type of partnership	Targeted countries
PUBLISHED	Research and development cooperation agreement	• World
Contact Person	Term of validity	Last update
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General Information

Short summary

An Austrian SME has developed a technology to produce high-quality composite materials with 99.9% proven long-lasting antimicrobial activity. These flexible materials are very homogenous, applicable on various advanced processing technologies and can be adapted to specific requirements. They are looking for a polymer composite material processing SME or a product development and manufacturing SME to complete a consortium for the next Eurostars 3 call.

Full description

This Austrian SME is specialized in smart material development with extensive experience on advanced processing technologies, including additive manufacturing, injection moulding, hot pressing, and sintering. They have developed a technology to produce high-performance polymer-based nanocomposites with excellent antibacterial/antiviral properties. The current aim is to transfer this technology to the market and to explore the production of antimicrobial/antiviral materials for coatings, medical devices, textiles, etc.

The recent COVID-19 pandemic has increased awareness about safety and hygiene, raising the need for effective strategies to significantly reduce the risk of infection transmission. One strategy involves the use of materials/components with inherent ability to kill or inhibit pathogens. Such antimicrobial and antiviral properties are strongly desired for high-touch surfaces (e.g. counters, tables, doorknobs, handles, desks, keyboards, etc.), protective apparel, facemasks, air filtering equipment, medical devices, and other products. Antimicrobial products can thus make the difference to control the spreading of infections, especially in crowded environments, such as

healthcare facilities, schools, and public transports.

The size of the global antimicrobial coatings market is expected to grow from €3.8 billion in 2021 to €6.2 billion by 2026. Stringent regulations on the indoor air quality, growing demand from the medical and healthcare sector to prevent healthcare-associated infections, and increasing adoption in various industrial applications are boosting this market growth.

To encounter the rising demand for such performing materials, they have developed special polymer-based composites with exceptional long-term antimicrobial activity.

The proposed technology is flexible, can be adapted to produce bioactive composites out of a number of matrixes, including medical-grade, degradable and non-degradable polymers (e.g., TPU, PMMA, PCL), and can be applied to a range of products. The company produces nanocomposite feedstock that can be processed via different methods, including injection moulding, extrusion, melt blowing, or 3D printing, and manufactured into bulk components, fibres, foams, etc. The nanocomposites can also be used for coating almost any type of material (metals, ceramics, wood, glass) and any surface (e.g., counters, handles, knobs, etc.) via conventional spray or dip coating technologies, as well as via wet deposition on textiles or yarns.

The nanocomposites can be formulated into plastic pellets or liquid forms and can be processed directly or mixed with untreated master batches without requiring any changes to the manufacturing process. The strong antimicrobial activity (> 99.9%) of different nanocomposite formulations has been certified by an accredited laboratory according to ISO standards, confirming the efficacy of these materials to prevent the growth of both Gram-positive and Gram-negative bacteria. The nanocomposite formulations are safe and non-toxic and can be tailored for each specific application to achieve the desired bioactive effect over time using the minimum amount of active antimicrobial agent.

The Austrian SME is now eager to further develop the potential of these composite materials and to develop together innovative applications with commercial potential through a cooperative Eurostars 3 project. The project aim is to upscale the material production technology and to exploit these bioactive materials to engineer innovative, high-performance, cost-effective products.

Advantages and innovations

Unlike current commercially available solutions, the company can provide a highly pure composition of the active agent, with significant benefits especially for biomedical applications where high-quality standards and the absence of potentially non-biocompatible substances are required. Long-term efficacy and stability over time are further key features that set these composites apart from competitors in the marketplace.

Another advantage over materials that use heat-sensitive organic molecules as antimicrobial agents is that these composites withstand high-temperature processing (injection moulding, etc.) without losing their bioactivity. The final product maintains very high homogeneity, thus ensuring that it presents no "blind spots" or untreated areas. This active ingredient acts without inducing the critical phenomenon of antibiotic resistance.

In summary, the new technology developed offers the following unique advantages:

- Certified long-term antimicrobial effect (> 99.9 % microbial reduction)
- 100% purity of the antimicrobial additive
- Applicability to a range of plastics
- Stable composition and homogeneous distribution of the additive within the polymer matrix
- Uniform biological efficacy
- High process reproducibility
- Customizability
- Suitability for industrial processing
- Price competitiveness

Stage of development

Lab tested

Sustainable Development goals

• **Goal 3: Good Health and Well-being**

IPR Status

Secret know-how

Partner Sought

Expected role of the partner

The Austrian company is looking for technology and research partners to complete a European consortium with the aim to submit a project proposal to the upcoming Eurostars 3 call.

At present, the consortium includes industrial and research partners with diverse competences in material development, material characterization, as well as functional and biological testing.

Further partners are sought (ideally from the Eurostars 3 participating countries) with experience in polymer/composite processing (injection molding, extrusion, 3D printing, spray coating, etc.), as well as manufacturers of devices, plastic components or coatings in the medical, automotive, food packaging, or textile fields to provide applications for the commercialization of the product.

Further collaboration options or participation in other European projects are also possible.

Type of partnership

Research and development cooperation agreement

Type and size of the partner

- **SME <=10**
- **SME 11-49**
- **SME 50 - 249**

Dissemination

Technology keywords

- **02007005 - Composite materials**
- **02007018 - Advanced Textile Materials**
- **06001018 - Virus, Virology/Antibiotics/Bacteriology**
- **02007024 - Nanomaterials**
- **02007015 - Properties of Materials, Corrosion/Degradation**

Targeted countries

- **World**

Market keywords

- **05006 - Anatomy, Pathology, Immunology, Physiology**

Sector groups involved