

FOOT-COAT-PROTECT

Antipathogen Coatings for Footwear Leather Protection

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THE TECHNOLOGIC AND BUSINESS INCUBATOR ITA TEXCONF

ITA TEXCONF is an entity in the infrastructure of innovation and technological transfer without legal personality, established within INC-DTP based on HG 406/2003, accredited for the Bioeconomy, Advanced functional materials and Environment and eco-technologies fields, Certificate no. 169/2026, issued by the Ministry of Education and Research.



ITA TEXCONF is part of the National Network for Innovation and Technology Transfer ReNITT and acts for the sustainable economic and social development of the textile sector, by ensuring access to technological performance, developing the innovative environment, introducing quality systems and developing human resources.

The incubator is involved in specific actions of collaboration with all 5 existing clusters in the textile field, of which it is part as an active member: Romanian Textile Concept Cluster – RTxC, ASTRICO NE, Traditions Manufacture Future, Transilvania Textile & Fashion Cluster and Fashion Future Cluster.

Services:

- ❖ Services of sustaining textile-clothing SME competitiveness within the competitional background of the market economy;
- ❖ Services aiming at creating partnerships and financing drawing in within the projects;
- ❖ Services aiming at the product, equipment, innovation technology promoting in the field of textile-clothing, as part of scientific events (fairs, symposiums, conferences, etc.);
- ❖ Mediating contracts of technology transfer/manufacturing of products, experimental models, prototypes and specific applications for technical textile, personal protective equipment, invasive and non-invasive medical devices, special-purpose items, etc.;
- ❖ Mediating contracts in the field of investigating the textile material and product properties, within the RENAR accredited INC-DTP laboratories.

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PROJECT AIM

The main aim of FOOT_COAT_PROTECT is to develop innovative antipathogen coatings for leather surfaces used in footwear, capable of reducing the transmission of pathogenic microorganisms — bacteria, fungi, and viruses. The project addresses the growing demand for bio-safe materials in high-risk environments (healthcare, food industry) and for vulnerable groups such as diabetic patients, focusing on long-lasting antimicrobial activity, human health safety, and reduced environmental impact.

PROJECT OBJECTIVES

CONCLUSION

- Design and synthesis of hybrid nanoparticle-based coatings (Ti, Zn, Cu) combined with antimicrobial polymers and bio-based additives;
- Achievement of durable antibacterial, antiviral, and antifungal activity, including against nosocomial and multidrug-resistant pathogens;
- Implementation of advanced deposition techniques (sonochemical methods) to enhance coating adhesion, uniformity, and durability;
- Development and testing of prototype footwear (medical, orthopedic, professional, daily use) with integrated antipathogen properties;
- Comprehensive evaluation of toxicological profile, biocompatibility, durability, and environmental impact ("safe-by-design" concept);
- Facilitation of technology transfer to industry, supporting innovation and competitiveness in the leather and footwear sector.

FOOT_COAT_PROTECT represents an advanced interdisciplinary approach at the intersection of materials engineering, nanotechnology, and leather processing technologies, aiming to develop next-generation functional materials with antipathogen properties.

The expected outcomes include high-performance, sustainable coatings with significant potential for industrial scalability and market implementation.

The project contributes to enhancing public health protection, improving footwear safety, and supporting the transition toward smart, biofunctional, and environmentally sustainable materials in the textile and leather industries.

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Keywords: antipathogen coatings, footwear leather, antimicrobial nanoparticles, bio-safe materials, diabetic footwear, nanotechnology, sustainable materials

