Horizonte Europa – Cluster 4 Industry

Partner search

Your contact details	
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Your organisation	
Describe your organisation:	Ventilatio Lab S.L. is an SME specialised in industrial ventilation, air-quality control and digital modelling of particulate emissions. The company develops advanced CFD-based (Computational Fluid Dynamics) methodologies to design, simulate and optimise ventilation in residential and industrial environments. Ventilatio Lab actively participates in the Galician innovation ecosystem, promoting R&D initiatives focused on worker protection, air quality and energy efficiency in stone-processing industries. The company is currently developing the SILICA-CFD concept as a digital innovation pathway to reduce respirable crystalline silica (RCS) exposure and to improve ventilation performance in high-dust workplaces. Ventilatio Lab collaborates with technological centres and SMEs from the stone, ceramic and cement sectors, supporting their transition towards digital and sustainable manufacturing practices through applied engineering and simulation expertise.
Type of organisation:	SME
List up to 5 keywords describing your sector or specialisation:	Industrial ventilation; CFD modelling; Occupational exposure; Digital twin; Dust control.
Your experience	
Have you already participated in an EU funded project?	No (not as a beneficiary yet). Ventilatio Lab has led multiple regional and national pilots in stone and ceramics and has participated in accelerator programmes (e.g., BFAero / Galicia) and collaborative R&D with technology centres.

Your project idea	
Reference of Call/topic of interest	• HORIZON-CL4-2026-01-MATERIALS-PRODUCTION-12: *Technologies for innovative extraction of critical raw materials (RIA)*
Your project idea: describe your project or idea, and how it contributes to the scope of the topic(s) you have identified.	**Project title:** *SILICA-CFD-CRM — Digital Twin and CFD Modelling for Dust and RCS Mitigation in Critical Raw Materials Processing* The SILICA-CFD-CRM project aims to develop and validate a digital workflow based on Computational Fluid Dynamics (CFD) and Digital Twin technologies to model, predict and mitigate respirable crystalline silica (RCS) emissions during the processing of Critical Raw Materials (CRMs), focusing on rare earth elements (REEs). While the final applicability of the system will target REE beneficiation and processing, pilot studies will be implemented in slate and granite fabrication facilities, where RCS emissions and dust behavior can be monitored in real industrial conditions. These facilities share very similar mechanical operations (cutting, crushing, grinding, polishing) to those found in REE processing. Moreover, in many European industrial areas, stone-processing and mineral-processing plants are located nearby, allowing possible transfer of fine material and dust between waste heaps or facilities. Understanding and controlling dust dynamics in such environments will therefore provide transferable knowledge and validated models for future CRM operations. **The project integrates:** • CFD-based simulations of air and particle flow during crushing and grinding. • Digital Twin environments optimize ventilation, capture systems and energy efficiency. • Occupational and environmental exposure assessment to RCS and other fine particulate emissions. • Replication protocols for SMEs to adopt safer, low-energy ventilation. By combining occupational health, digitalization and sustainability, SILICA-CFD-CRM will contribute to the *Critical Raw Materials Act* and the *Green Deal Industrial Plan*, supporting the EU's strategic autonomy through safe and sustainable processing technologies.
List up to 5 keywords describing your project idea:	Respirable crystalline silica; CFD simulation; Digital twin; Rare Earth Elements; Critical Raw Materials.

Your offered expertise and contribution	
Your offered contribution	Ventilatio Lab offers expertise in advanced ventilation systems, CFD modelling and sensor-based monitoring of particulate emissions in stone-processing industries. Building on the SILICA-CFD methodology, the company can lead pilot testing and industrial validation of the digital twin system in real facilities, ensuring applicability to both traditional stone industries and future CRM processing plants. The company will contribute to the development of CFD models, validation with field data, design of energy-efficient ventilation layouts and occupational-exposure monitoring campaigns.
Your offered role (Coordinator, Work package leader or partner	Work Package Leader (Digital Modelling & Industrial Ventilation)