

The Consortium

PROJECT COORDINATOR

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3 SMEs
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FACTS & FIGURES

Type of action: LIFE Project Grants

*Topic: LIFE-2021-SAP-ENV-ENVIRONMENT
Circular Economy, resources from waste,
Air, Water, Soil, Noise, Chemicals, Bauhaus*

Start date: 1 August 2022

Duration: 42 months

EU Funding: 1,3 M€

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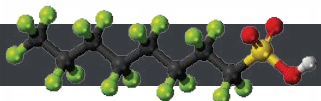


**PER AND POLYFLUORINATED
ALKYL SUBSTANCES IN
GROUNDWATER: WATER
TREATMENT FOR INDUSTRIAL
USE IN THE SURFACE
FINISHING INDUSTRY**



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THE CONTEXT



PFASs (Per and PolyFluorinated Alkyl Substances), are of highly persistent, synthetic chemicals that accumulate in the environment and in the human body and can have toxic and adverse effects.

PFASs can be transported in surface water or groundwater contaminating drinking water and water used in urban and industrial processes.

Due to their high energy carbon-fluorine bonds, PFASs are not degradable and the remediation of polluted sites is technically difficult and costly.

➔ *Systemic and sustainable solutions need to be found to deal with the rising issue of these "forever chemicals".*

In the **Surface Finishing Industry**, PFASs are used as mist suppressants to prevent air emissions of toxic metal fumes. In many countries, the use of such substances was required to be phased out. However, PFASs are still used in chromium electroplating to control hexavalent chromium emissions.

➔ *The treatment of wastewater deriving from the chromium plating industry for PFASs removal is necessary to prevent the introduction of PFASs from the metal surface finishing industry.*

THE PROJECT



The **LIFE FOUNTAIN** project proposes an environmentally sustainable and cost-effective **remediation solution** for the reduction of groundwater and aquifer PFASs (PFOS, PFOA, GenX, PFBS, etc.) pollution by utilizing an innovative technology based on **functionalized magnetic nanoparticles** that will allow the use of treated groundwater in the **Surface Finishing Industry** and the downstream treatment of wastewater, restoring aquifer resources and reducing water consumption.

3 MAIN ACTIVITIES

1 IN-SITU MONITORING OF PFASs.

Development of new methods and protocols for the proper monitoring of PFASs in the water environment. Surface Enhanced Raman Spectroscopy (SERS) that is based on the utilization of appropriately functionalized Magnetic Nanoparticles will be used for in-situ monitoring of PFASs.



2 CAPTURE AND DECOMPOSITION OF PFASs

Functionalized Magnetic Sponges exhibiting high surface area and high selectivity will be used for the treatment of contaminated groundwater and process water. The adsorbent magnetic sponges will be regenerated using appropriate solvents in order to be used again. The captured PFASs on the surface of Magnetic Sponges will be treated with Electrochemical Advanced Oxidation Process technology for their complete decomposition.



3 DEMONSTRATION ACTIVITIES

Two treatment plants based on Magnetic Sponges technology will be installed and with several monitoring points throughout the process, in order to eliminate PFASs from the contaminated aquifer water stream and from treated process wastewater.



Economic & Ecological Benefits

- 1 Lowering operation cost by reducing water bill
- 2 Reducing wastewater treatment costs
- 3 Potentially improving pollutant removal efficiency in wastewater treatment
- 4 Reducing or delaying need for treatment capacity expansion
- 5 Reducing the environmental risk related to the transport of wastewater
- 6 Restoring contaminated groundwater sources and cutting down on freshwater use
- 7 Reducing water resource consumption
- 8 Early warning of harmful release thanks to the in-situ analysis