

# Doctoral Candidate (PhD) Position in Horizon Europe MSCA-DN SCARPA

## About the company

With the intention of reconciling the economy and sustainability of the plastic industry, POLYKEY is a spin-off company created in 2020 that provides R&D solutions and produces innovative materials for the polymer industry. ([www.polykey.eu](http://www.polykey.eu)) To contribute to the more efficient and sustainable production of plastics, POLYKEY acts along three lines that have been established as objectives for a transition towards a sustainable future: bio-sourced plastics, chemical recycling of polymers, and materials for energy storage. The company arises from academia with the aim of transferring its most innovative and successful technologies to the industrial world.

## About SCARPA

Applications are invited for one Doctoral Candidate (DC) position within the Marie Skłodowska-Curie Actions Doctoral Network “SCARPA – Sustainable and Circular Footwear Training Program”, funded under the Horizon Europe Programme of the European Commission.

SCARPA brings together leading universities, research institutions, and companies from Belgium, the Netherlands, Spain, Italy, Denmark, and Austria to address one of today’s most pressing challenges: less than 5% of shoes are currently recycled. By training 15 Doctoral Candidates across Europe, SCARPA will tackle the full life cycle of footwear — from design to processing, use, reuse, and recycling — and lay the foundations for a truly circular footwear economy.

## Project Description

The doctoral project will focus on developing new selective solvolysis reactions for footwear polyesters under mild conditions. The emphasis will be on optimizing the reaction conditions to maximize sustainability and industrial applicability.

Research will begin with model polyesters before progressing to real footwear waste streams, including sneakers, textile shoes, and leather shoes. The work will integrate dissolution and depolymerization strategies in collaboration with other doctoral projects of the SCARPA project. Special focus will be placed on downstream processing to obtain high-purity monomers suitable for repolymerization and on the systematic characterization of both recovered monomers and non-recycled residues using advanced analytical tools (NMR, FTIR, HPLC...).

## Objectives

- Develop a selective and efficient solvolysis recycling technology for leather, textile, and synthetic footwear.

- Optimize process parameters to maximize yields for polyesters with additives, impurities, or blends.
- Establish methodologies to link shoe composition with depolymerization performance.

#### Planned Secondments

- University of the Basque Country (EHU): Investigation of heterogeneous catalysts for depolymerization.
- Ghent University (UGent): Support for downstream monomer processing using ASPEN simulations and molecular modeling.

#### Candidate profile

- Master's degree (or equivalent) in Chemistry, Polymer Chemistry, Chemical Engineering, or related fields.
- Proven experience in polymer/organic chemistry or materials science.
- Creative, open-minded, curious, and proactive personality.
- Strong teamwork skills and willingness to work in a start-up environment.
- Fast learner, aspiring to independence in laboratory research.
- Good command of English (written and spoken).
- MSCA Mobility Rule: At the time of recruitment, the candidate must not have resided or carried out their main activity (work, study, etc.) in Spain for more than 12 months in the 3 years immediately before the start date.

#### What we offer

- A 36-month, fully funded doctoral position within the prestigious MSCA framework.
- High-level training in an international, interdisciplinary, and intersectoral network.
- Joint supervision from academic and industrial partners, ensuring both fundamental and applied expertise.
- Opportunities for secondments at leading European institutions.
- A vibrant, collaborative environment aimed at advancing the circular economy of footwear.
- Attractive salary

**Starting date:** February-March 2025

**Application deadline:** 31st of October of 2025

If you are interested in applying, please send your CV and motivation letter to [info@polykey.eu](mailto:info@polykey.eu) with the subject: Application – Position in Horizon Europe MSCA-DN SCARPA.