

# IMPACT

# REPORT



# INTRODUCTION

This report presents the results of one of the innovation tracks carried out by the teams of the European Interreg project Wonderful.stream (2020-2023). In this project, seven partners from the Euregio Meuse-Rhine have pooled their knowledge, strengths and resources to jointly support small and medium-sized enterprises in their transition to a circular economy.

Wonderful.stream offers companies free advice and guidance on the recovery of their residual flows; it also initiates and facilitates the co-creation of circular solutions with experts in technology, design and business development in the framework of innovation tracks.

This report focuses on the results of PuriFungi's innovation track.

## INNOVATION TEAM

### DESIGN

Louise Charlier

### BUSINESS DEVELOPMENT

Pauline Pötgens et Sarah Frenck (EKLO)

### COORDINATION

Pauline Pötgens et Sarah Frenck (EKLO)

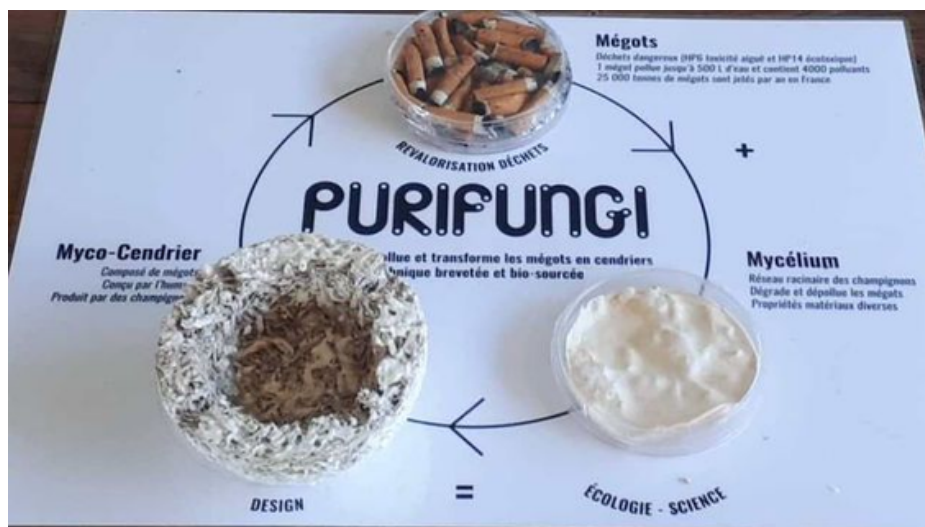
Sara Boxus et Véronique Closon (Wallonie Design)

# PURIFUNGI

Founded in 2020, the start-up PuriFungi has developed a process for depolluting cigarette butts using fungi. The process, called mycoremediation, produces a bio-composite material. This material consists of degraded cigarette butts (50%), hemp mulch and mycelium (50% organic substrate).

The company's activity is developing around several actions:

- raising awareness among smokers and communities (design and manufacture of mycomaterial ashtrays for festivals) ;
- the collection of cigarette butts ;
- depollution of butts.



PuriFungi has developed a solution for the decontamination of cigarette butts. At the end of the mycoremediation process, a residual material is produced. For the moment, PuriFungi is developing ashtrays to recycle this material. These are used to raise awareness among citizens and communities, mainly at festivals.

PuriFungi intends to develop its butt collection network with local authorities. If collection develops, the start-up will have, in the long term, an increasingly large quantity of residual material. It is therefore necessary to

look into solutions for processing large quantities of residual material. PuriFungi's wish in participating in Wanderful.stream is therefore to find high added value applications for this material.

During the Bootcamp, a concept for small modular bricks was identified by a team of students from ESA Saint-Luc Brussels and Liège, HELMo Gramme, HEC Liège, IFAPME Liège-Huy-Verviers, HEPL and the Eco-Conseil Institute, led by designer Louise Charlier.

[www.purifungi.com](http://www.purifungi.com)



## 01.

Exploration of possible applications for waste material made up of cigarette butts

## 02.

Knowledge of the technical properties of the material

## 03.

Valorisation of a material developed on the basis of a local substrate

# INNOVATION PROCESS

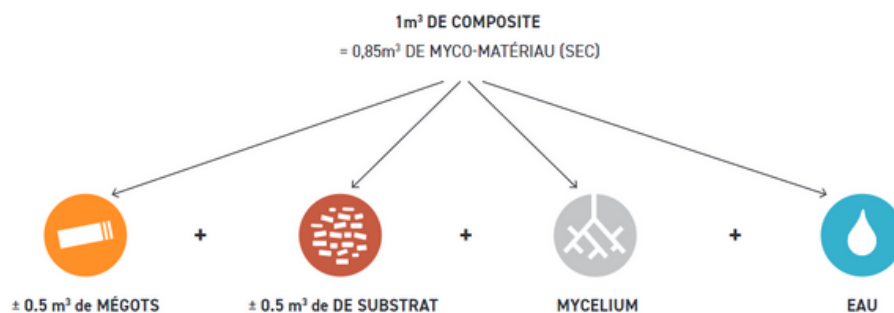
The project team was tasked with finding a high value-added application for the waste material from the mycoremediation process.

## STEP 1

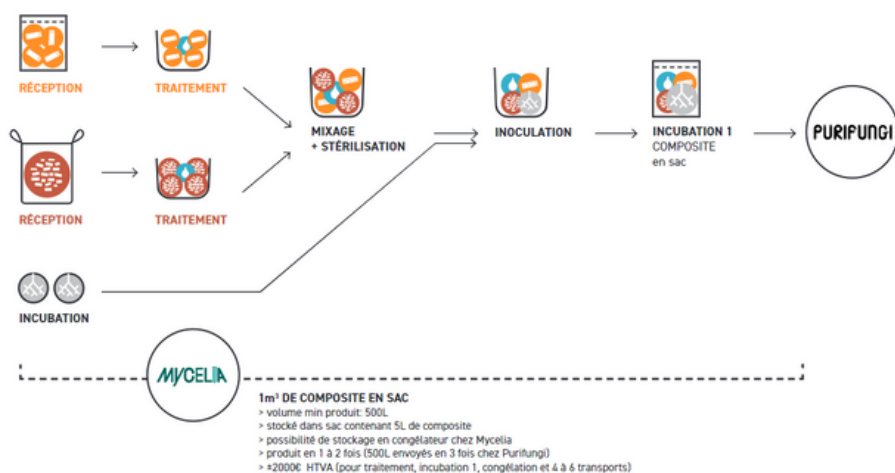
### Production scenario: the case of small bricks

Starting from a concrete case, i.e. the design of small modular bricks, the designer in charge of the project team visually broke down all the production steps. This gave an overall view of the process and enabled the production to be run on a timeline.

#### SCÉNARIO BRIQUETTES EN CHIFFRES



## SCÉNARIO BRIQUETTES COMPOSITE - INCUBATION 1 (DANS SAC)



## STEP 2

### Exploration of possible applications

A market study and qualitative interviews were carried out with research centres, companies, project leaders, etc. This made it possible to identify the advantages and disadvantages of this residual material, more specifically, for the space design sector. At the end of this research, a specification of the material was drawn up and the economic feasibility of certain applications was studied.

## STEP 3

### Technical analysis

In order to have a better knowledge of the properties of the mycomaterial and, more particularly, those related to its dangerousness, a technical study was requested. The objective of this study is to identify the most relevant application for this material according to its characteristics (e.g. flammability, toxicity, explosiveness, combustion, etc.)

# RESULTS

The joint work of design, business and technology expertise has helped PuriFungi to better visualise the implications of developing a production line, the efforts required and the unknowns that the start-up still needs to work on.

The results of the technical study will be decisive in removing some of the concerns, particularly concerning the mycoremediation process for cleaning up cigarette butts. Indeed, for the project to develop properly, it is necessary to resolve certain questions: Can this material be present in an enclosed space? Does it emit volatile organic compounds? Can it be brought into contact with any type of material? This study will provide answers to these questions and define possible applications.



# CONCLUSION

To date, the conclusions of the avenues explored have led to unfavourable findings for the development of an application based on this mycomaterial.

Indeed, it is necessary for the project to acquire knowledge, particularly on the properties of the material, as well as financial and human resources to be able to develop a promising project that meets a market and can be profitable. In addition, the project team was able to observe that the current market is not yet favourable, demonstrating the difficulty of companies already well established in the field of mycomaterials. Indeed, the producers of myco-materials are finding it very difficult to produce at a reasonable price. These companies are currently not profitable and are focusing their activities on research rather than production.

- 
- 01.** In the short term, through technical studies, it is essential to gain a better understanding of the properties of the mycomaterial and to know its end-of-life.
- 
- 02.** In the medium/long term, work on the development of an application for this material that enhances its properties and the quantities of butts collected, while taking into consideration the needs of the market and the appropriation of the material by users, as well as the economic profitability of the project.



# Interreg

## Euregio Meuse-Rhine

European Regional Development Fund



Interreg EMR transcends borders by enabling collaboration between regional areas in different countries. We are investing in projects on innovation, the economy, social inclusion and training, and territorial cohesion. By encouraging cross-border collaboration, we strengthen the economic and social fabric in the border region between Belgium, Germany, and the Netherlands.

---

### DISCLAIMER

The source material of this report is made available under the conditions of the Creative Commons Attribution - NonCommercial - NoDerivatives 4.0 International (CC BY-NC-ND 4.0)



### CONTACT INFO

info@wonderful.stream  
www.wonderful.stream



In cooperation with:



With the support of:

