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France (Channel Manche) England

BIO-CIRC Project

European Regional Development Fund

BIO-CIRC Project

Bio(and)**C**ircular **I**nsulation for **R**esourceful **C**onstruction

Presentation of Prototypes Produced

30th June 2022 – Final Version

EUROPEAN UNION
European Regional Development Fund

nomadéis

ASBP The Alliance for Sustainable Building Products

therma fleece Nature's finest insulation

backtoearth

Abstract of the project

The BIO-CIRC Project, Bio(and)Circular Insulation for Resourceful Construction, intends to tackle the building sector's high carbon, energy and resources dependencies while taking advantage of an unused waste resource: polyester from waste bedding.

The project aims to conceive, develop and deploy 3 prototypes of innovative low-carbon thermal insulation material made from polyester and combined with natural fibres. It intends to promote the emergence of a bespoke waste polyester valorisation industry and the use of virtuous Natural and Recycled Fibre Insulation products.

This project is carried out by a cross-channel partnership of 4 key and complementary links in the building sector's value chain:

- Nomadéis (lead partner)
- Alliance for Sustainable Building Products
- Eden Renewable Innovations
- Back to Earth

Planned over 2 years, the BIO-CIRC project receives funding from the European Regional Development Fund (ERDF). The ERDF's contribution amounts to €399,600 for a total budget of €499,500.

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Report on prototypes' production

As part of the T1.3 activity, project partner ERI has led the production of the first version of the BIO-CIRC prototypes.

Four fibre components were utilised to produce the prototypes:

1. Reclaimed and refiberised polyester sourced from waste duvets (**rcPET**) – fibres created by cutting duvets and pulling to open the fibres apart.
2. Recycled polyester staple fibre made from waste polyester packaging (**rPET**) – an extruded fibre created from cleaned waste polyester (PET) bottles and other packaging.
3. Scoured sheep's wool (**Wool**) – loose wool fibres that were cleaned and degreased.
4. Polyester bi-component binder fibre (**bi-co**) – a binder fibre commonly used in non-wovens comprising a high melting point core fibre surrounded by a low melting point polyester sheath that adheres to surrounding fibres.

Sourcing of the raw materials

As indicated, the original prototypes combine sheep wool, recycled PET and duvet waste. Prototype production requires sourcing sheep wool and polyester from waste duvets. Recycled PET is produced by Partner ERI in its own facilities.

The following picture show above-mentioned raw materials.

Figure 1: Sanitized polyester filling from duvet waste

Figure 2: Sheep wool

Prototype 1: reclaimed and recycled PET (rcPET & rPET)

The first version of the prototype contains 65% of reclaimed PET (rcPET from duvet waste), 25% of recycled PET (rPET from bottles) and 10% of PET co-binder.

Figure 3: Samples of prototype 1

Prototypes 2 and 3: reclaimed PET and sheep wool

Prototype 2 is composed of 65% wool, 25% rcPET (reclaimed and recycled from bedding waste) and 10% co-binder.

Figure 4: Samples of prototype 2

Prototype 3 is composed of 51% wool, 39% rcPET (reclaimed and recycled from bedding waste) and 10% co-binder.

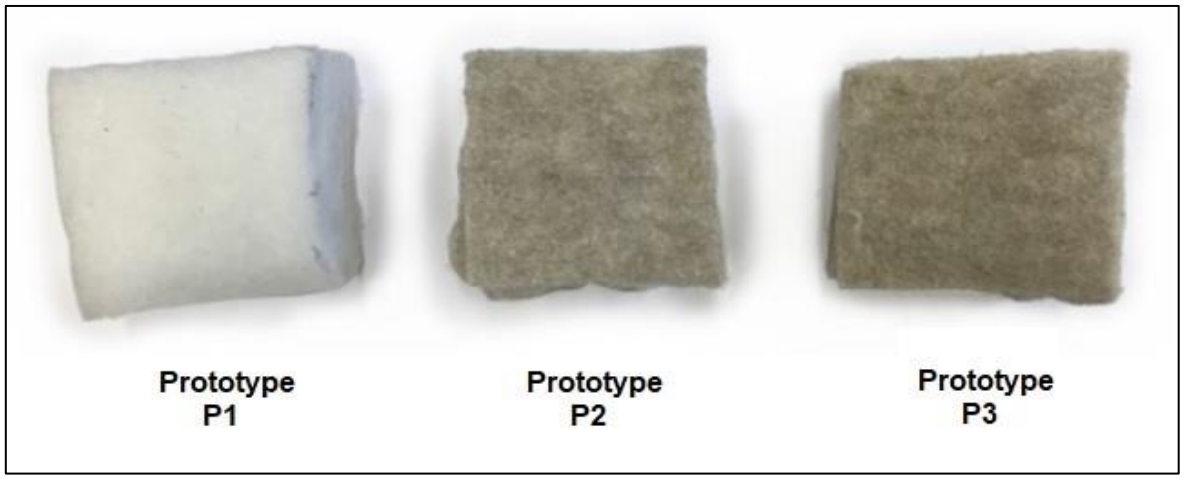

Figure 5: Prototypes

The table below summarizes the composition of each prototype.

Table 1: Prototypes' compositions

	rcPET recycled from duvets/pillows	rPET recycled from PET bottles	Sheep's wool	PET cobinder
Prototype 1	65%	25%	0%	10%
Prototype 2	25%	0	65%	10%
Prototype 3	39%	0	51%	10%

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The BIO-CIRC project is part of the cross-border European Territorial Cooperation (ETC) Programme Interreg VA France (Channel) England and benefits from financial support from the European Regional Development Fund