# ECOPLASBRICK Project

Recycled plastic based panels for building field

ecodesign | eco-innovation | circular economy | eco-friendly products | reducing environment impact | production process

## PROJECT DESCRIPTION

The **ECOPLASBRICK project** has made it possible to introduce a sandwich panel to the construction market, the central layer of which is made up of mixed plastics normally destined for landfills or incineration.

The panel can be produced with different core density, different types of external layers (gres, aluminum, fiberglass, plasterboard), in any desired color, it is economical and can be used for vertical (ventilated facades, internal partition walls) or horizontal solutions (raised floors) exploiting the different densities of the inner layer in order to obtain a more or less flexible and more or less heavy panel. Finally ECOPLASBRICK also has good thermal and acoustic insulation properties.

During the design phase an industrial-scale production process was carried out which made it possible to reduce the use of polyurethane replacing it with densified mixed plastic flakes of different sizes and obtain – by a compression moulding technology - panels of several sizes.

The choice of the type of polyurethane (tested during the trial phase of the process) and the introduction of a greater quantity of plastic inside the panel allowed to improve the mechanical qualities of the product.

## PROJECT PHASES

During the project an production process was developed and optimized for industrial scale.

In the process densified flakes of different plastics and polyurethane precursors are mixed and pressed with compression moulding. In order to improve the mechanical properties of the panel, various polyurethanes have been tested, obtaining a more compact core containing a greater quantity of recycled plastic and a reduced quantity of polyurethane.

The phases of the project were:

- characterization and optimization of the fraction of post-consumption plastics to be used;
- choice of polyurethane to be added to post-consumption plastics;
- optimization of the panel production process by compression moulding;
- characterization of the panel;
- realization of demonstrators and subsequent validation of the experiment.

The **main advantages** of the developed process are:

- the possibility of producing the panel with a normal compression moulding line;
- great versatility regarding the skins (outer layers) that can be used;
- further possibility to customize the product thanks to the availability of numerous polyurethane formulations;
- lightweight panels with good thermal and acoustic insulation properties.

## PROJECT RESULTS

ECOPLASBRICK is an energy efficient product that meets the needs of modern architectural projects as it is a non-perishable product and all the materials used for its production are made to meet the standards required by the construction sector.

ECOPLASBRICK can be produced with different skins, changing their aesthetics thus satisfying any design requirement; it is available in different thicknesses and weights according to the final applications' needs.

The project has not carried out a LCA for comparison.

**Some of the most attractive characteristics of the ECOPLASBRICK panels for the construction sector are:**

- *energy efficient*
- easy to install
- requires little maintenance
- 100% waterproof
- Highly resistant to fire

**Technical data: the characterization performed according to the norm EN 12825 for use of panel for raised floors is provided below. The panel falls in class 1 (floors for areas with light pedestrian traffic):**

- EN 12825-5096 N load limit (class 1)
- EN 12825-2548 N working load (safety coefficient k = 2)
- EN 12825-10192 N load on the base
- EN12825 hard body impact – passes the test
- EN 12825 soft body impact - passes the test
- EN140 acoustic insulation - 36 dBA
- EN 13501-1 reaction to fire - Bfl-s1


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**Acronym**
ECOPLASBRICK

**Number of reference**
ECO/10/277233/SI2.596954

**Reference Programme**
COMPETITIVENESS AND INNOVATION FRAMEWORK PROGRAMME (CIP) ECOINNOVATION

**Beneficiary Coordinator**
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**EU contribution**
916.033,00

**Call Year**
2010

**Start Year**
2011

**End Year**
2014

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