



Ground fibreglass sample.
Waste transformed into a secondary raw material.



PROJECT Life



About LIFE+ / Why Bra Servizi

The LIFE Programme (programme for the Environment and Climate Change) is the EU's funding instrument for the environment.

The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental and climate policy and legislation by co-financing projects with European added value in order to meet objectives and targets set by Europe 2020, 7 initiatives related to the environment and other areas.

LIFE is divided into two sub-programmes: Environment and Climate Action. The sub-programme for the environment has three priority areas:

- Environment & Resource Efficiency;
- Nature and biodiversity;
- Climate Governance and Information

LIFE which began in 1992, has co-financed almost 4000 projects across the EU, contributing approximately €3.1 billion to the protection of the environment.

info: <http://ec.europa.eu/environment/life/>

The Environmental Issue

The environmental issue addressed by the programme is the disposal of fibreglass waste.

Fibreglass (often referred to as Glass Fibre Reinforced Plastic, GFRP) is a composite building material made of strands of glass (either as long filaments or short-fibred glass wool) encased in a matrix of thermosetting resins, usually polyester, vinyl ester or epoxide based, which, with the help of special catalysts and accelerants, polymerize at room temperature.

From the 1950s onwards, fibreglass, due to its light weight, strength, stiffness, exertion and corrosion resistance, as well as poor electrical conductivity, has been used in a wide variety of applications.

However, the recycling process of such products is much more complicated than the recycling process of thermoplastic materials.

LIFE+ Enrich a Poor Waste

"LIFE Enrich a poor waste" is a demonstration project co-financed by the European Commission through the LIFE programme, whose aim is to recycle, ennoble and enrich fibreglass waste, thus creating a range of innovative fire-proof, sound absorbent, insulating and shock resistant components as well as easy to clean panels to be used in sustainable private and public buildings. The panels are designed to be easily dismantled and reused.

Another objective is to set up procedures for classes of waste that will be inserted inside panels and covered with natural products (such as leather, wood, plasterboard, cork, rubber or textile).

The project, developed in a collaboration between Bra Servizi S.r.l. and the University of Padua, began in July 2013 and came to a successful end in June 2016.

For information on the project visit Bra Servizi's website: <http://www.braservizi.com/en/about-us/life12-envit000579-life-enrich-a-poor-waste/>

recycle
ennoble
enrich
fibreglass
waste

Innovation

The project involved several innovative aspects, ranging from waste collection strategy to methods used in the manufacturing process of the new panels and their final production.

The setting up of a database indicating neighbouring GFRP waste collection points and the relative quantity produced has enabled, for the first time, forecasting strategies to be implemented for the re-treatment of such waste. Usually main waste disposal sites show a certain seasonality and an almost predictable quantity per year: this information has allowed collection and re-treatment planning, thus avoiding allocating an excessively large area for the temporary storage of the waste before it is treated. This minimizes the risk of waste dispersion into the environment, since the time between collection and re-treatment is the shortest possible. To this end Bra Servizi has been working with the Ministry of the Environment and for Protection of the Land and Sea, Cuneo Provincial Branch, in order to obtain an environmental permit for the treatment and recovery of fibreglass waste into a secondary raw material.

A second innovative and important factor was the manufacturing of combined structures, namely multi-layered panels, during the re-treatment of GFRP waste. The functional parts of the new panels (the back, with soundproofing or reducing properties; the front, aesthetically pleasing, easy to clean, soft and shock resistant) were put in place immediately after the core of the fibreglass panel had been formed. This important quality of the new product is achieved thanks to the re-cycling of ground waste, which already contains fibres steeped in resins, thus enabling the distribution of newly injected resin on the surface of the panel core. This results in a smoother surface, which will not require polishing, and in the availability of reactive species (glass fibre is inert) to allow the adhesion to the functional layers.

Last but not least, the new panels, made with fibreglass waste, have exceptional properties, that are not available even in the latest and most innovative ceramic or polymeric based covering materials: the multi-layered structure allows synergy between several types of materials, resulting in panels that are good thermal insulators, light weight, sound-proof, shock resistant, radio-transparent, wholly recyclable, easy to install and dismantle, designed for deconstruction and, most importantly, act as a thin supporting layer for valuable aesthetic products such as leather, wood, rubber, plasterboard, cork and decorations.

Results Achieved

A central GFRP waste collection point was created at Bra Servizi. This was initially dedicated to waste of a small size, but, after reduction by special equipment, it is also possible to treat extremely large waste.

Special trucks that reduce waste volume at the collection point have increased the load capacity.

A database has been created to monitor collection activity and identify places where GFRP waste is produced. The availability of such data, which is continually being updated, allows waste collection and treatment strategies to be developed and modified.

A grinding mill was created to reduce the volume of GFRP waste by turning it into flakes then powder, thus enabling it to be converted into a usable secondary raw material.

A demonstration line was set up for the re-treatment of the GFRP waste that resulted from the manufacturing of new fibreglass panels. The new panels were manufactured using two moulding techniques: in the first the panels were combined with soft materials (such as leather), in the second they were combined with high-performance materials (such as cork or wood).

A demonstration range of panels were manufactured and installed in public and private buildings to allow their properties to be tested and the results validated.

End of life disposal procedures were defined for the new panels and a LCA (Life Cycle Assessment) carried out.

The panels produced by Bra Servizi Srl with ground fibreglass were characterized according to two specifications:

Heat transfer:

Thermal resistance

Acoustics:

Sound insulating capacity

recycle
with love
and respect
for the environment

