Newsletter N.3 - July 2017
Photolife Project, LIFE+2013

*P*hotoLife *P*roject

LIFE13 ENV/IT/001033 cofinanced by EU LIFE+ program

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1. Prototype construction: mechanical pretreatment section

The Photolife mechanical pretreatment section has been designed to treat different types of photovoltaic panels (Si, Cd-Te and new generation ones) and to produce specific samples to be fed into successive (physical and chemical) treatments. This phase of the process is particularly important because the efficiency of the recycling process depends on the granulometric distribution of the producted samples. The coarse fraction is sent to the physical solvent treatment unit allowing the detachment of polymeric fraction from glass, while the fine and finest fractions are sent to the chemical treatment section where a leaching process allows to recover the metals contained in the photovoltaic cell.

As well as the solvent treatment, also for the mechanical pretreatment the container solution has been chosen, so that it could be easily carried. The core of this section is the shredder: several studies have been carried out to optimize the equipment's features specifically for the photovoltaic modules that contain glass as main component. A single-shaft shredder has been designed and built with a charge hopper and a hydraulic pusher that drives the panel onto the rotor. Once the panel has been shredded, the crushed sample is drawn through a screw conveyor that feed it into a first sieve to separate the finest fraction. The remaining sample comes in a second sieve that separates the intermediate fraction from the coarse fraction.

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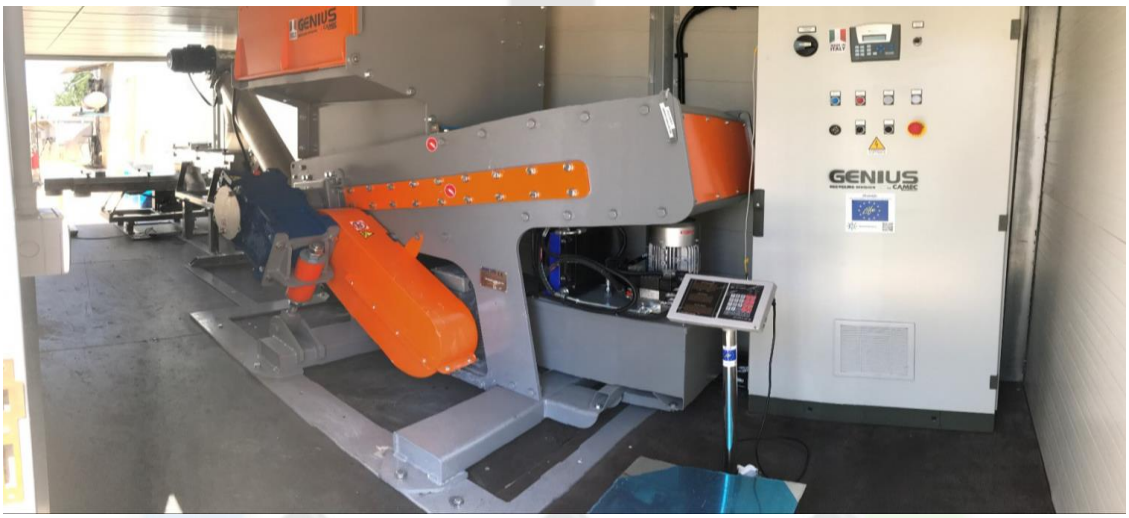
Mechanical pretreatment section: overview



Shredder, cochlea and sieves

Shredding sample

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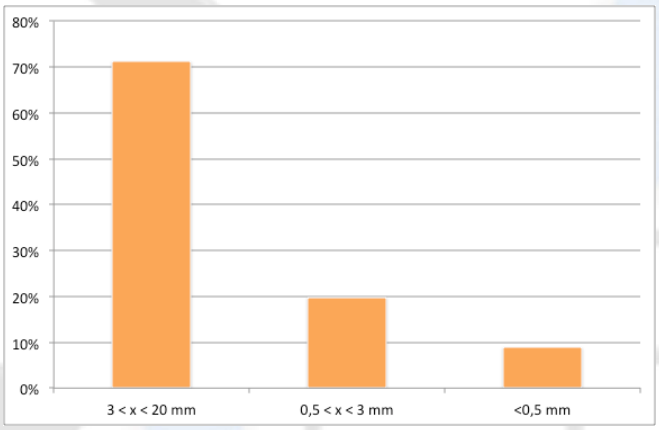
1. Shredding and sieving experimental campaign

Several experimental campaigns were carried out in the mechanical pretreatment section. After the treatment, the shredded glass quality has been checked and the shredding treatment was considered suitable as the granulometric distribution was the desired one.



The coarse fraction sent to the physical treatment with solvent represents about 72% of the sample produced in the shredding.

1. Dissemination, Final Conference & Open Day

The Photolife project's dissemination activity is done through publications in sector and dissemination magazines; presentations to congresses, workshops and publications of articles in scientific journals. A new press release is expected by the end of July in the ''Campo de 'Fiori'' magazine edited at Civita Castellana, the city where the prototype containers are currently being placed. A new publication "Thermal vs. Solvent Treatment for Material Recovery from End of Life Photovoltaic Panels: Environmental and Economic Assessment" was submitted to the *Journal of Cleaner Production* by Pagnanelli et al.

A meeting was also held at the Environmental Italian Ministry to deepen the issues related to the drafting of legislation about photovoltaic modules.

On 24/07/2017, the **Final conference** of the project was held at the Eco Recycling offices in Rome and the **Open Day** on the site where the prototype was installed in Civita Castellana, Viterbo.