

PROWASTE

Efficient utilization of Plastic Waste through Product Design and Process Innovation

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INFORMATION ON THE ECO-INNOVATIVE SOLUTION PROVIDER

This eco-innovative solution is the output from the project titled “Eco-friendly high performance fiber composite material” co-funded by the European Commission within the framework of the Competitive and Innovation Program. This solution has been developed by a team coordinated by CETMA, Centro di Progettazione, Design e Tecnologie dei Materiali, (IT), in partnership with Centro di Progettazione (IT), Universita del Salento (IT), MASMEC (IT), OGLE (IT), Industrial Sevillana de Reciclaje de plasticos (ES), Solteco Madera Plastica (ES), Cicloplast (ES).

SHORT DESCRIPTION OF THE ECO-INNOVATIVE SOLUTION

The innovation consists of the use of post-industrial and post-consumer plastics for an intrusion process to produce a material that has a look similar to that of wood. The introduction of longitudinal pultruded rods into the recycled plastic beam can be done without the need for a substantial modification of existing plant and machinery. The result is a significant enhancement of flexural stiffness and creep resistance, allowing the use of thinner beams and the production of lighter products, with greater aesthetic features than current recycled furniture. Compared to unreinforced plastic lumber, the flexural properties are increased by a factor of three. Recycled Plastic Lumber (RPL) is mostly used for many different outdoor applications such as park furniture or decking. The material is particularly suitable for applications where there is contact with water and soil as plastic lumber is resistant to decay.

INDUSTRIAL SECTOR – MARKET SEGMENT AND ACTUAL APPLICATION IN INDUSTRY

25 Furniture and Fixtures

INDUSTRIAL CLASSIFICATION - NACE CODE;

31 Manufacturing of furniture

1. DESCRIPTION OF ECO-INNOVATIVE SOLUTION

Technical aspects of the eco-innovative solution

The core element of the new technology consists of equipment to feed glass fibre in the form of pultruded rods through a mix of recycled plastic (polymers and non-polymeric materials) or wooden pallets. The rods are introduced into the plastic matrix during the extrusion phase in the production cycle and the method doesn't require any substantial modification of the conventional production plant used for moulding plastic lumber. A material is created with sufficient stiffness that the quality and performance requirements for outdoor applications can be fulfilled. The parameters for the production process and the equipment needed for the production of recycled plastic lumbers reinforced with rods are defined by the project team.

The project partner MASMEC s.r.l., Italy is specialised in the design of this equipment and offers individual system components as well as the entire plant to produce pultruded bars and the glass fibre. Plastic flakes and wood pallets can be obtained from local suppliers. The Spanish partner SOLTECO MADERA PLASTICA S.L offers the final product. Final products are mainly used for outdoor applications, e.g. benches, fencing, railway sleepers.

Economic and environmental benefits of the eco-innovative solution

Equipment costs are approx. 100,000€. The final output and the economic benefits depend on the production capacity of the extruder installed downstream from the feeding system. The speed of the unrolling of the pultruded rods could be easily customized according to the extruder capacity. Usually in intrusion, the production capacity of the extruder is around 200 kg/hour.

Environmental benefits consist mainly in a reduced amount of polymers sent to landfills and in the reduced use of virgin polymers.

2. AVAILABILITY OF THE ECO-INNOVATIVE SOLUTION AND BUSINESS PARTNERSHIP

Market readiness, Trade mark, existing market coverage, commercialization strategy

The solution is available on the market in Spain. The intrusion process is not well known in Europe but very common in the USA. There is no trade mark available.

Requirements to adapt the solution to the local market and potential applications/market size

No specific requirement to adapt the solution to the local market. However, sorted polymers in the form of scrap need to be available.

On-site after-sales services support and the technical assistance requirements

Technical support provided from Spain.

Targeted local business partners

Plastic producing industry that uses recycled plastic and companies using intrusion technology. Industries intending to start up an intrusion line for the production of plastic lumbers

Type of local business partnership sought

Masmec : Equipment sellers

Licensing of the technology (correct materials, correct mixing of raw materials)