ROADS SUSTENTABILITY: USING RECYCLE MATERIALS ON ROADSIDE EQUIPMENT

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Waste – Problem or Opportunity?
Ecovia Project - Summary

- **LIFE 2005 ENV/P/000366**
- **Duration:** 1/11/2005-30/4/2009 (42 months)
- **Total Budget:** € 1,240,454
- **EC contribution:** € 617,727
Ecovia Project – Main Objective

Reuse of waste currently sent for energy recovery or landfill, to produce new products for a range of roadside applications
Ecovia - Expected Results

- Improve the rates of materials recycling
- Get the highest possible incorporation of recycled materials in the manufacture of new products
- Produce, at competitive prices, new products with the same technical specifications of the products currently used
- Evaluate product performance in real-world scenario
- Increase the environmental awareness of citizens on the recycling sector and the possible use of recycled materials
Ecovia - Waste Materials

**Plastics**

**Cardboard Packages for Liquid Food (CPLF)**

**Rubber**
Ecovia – Partners and Subcontractors
Brisa – Ecovia Project Leader

- Founded in 1972
- Portuguese largest operator of highways and a reference at European level
- LIFE Ecovia Project Coordinator
- Installation and use of the products developed
ECOVIA Project – Project Phases

1. Collection, sorting and preparation of the waste materials, including laboratory testing

2. New products manufacturing

3. Economic and technical viability study on the new products, including their performance on a real scenario

4. Results dissemination for the general public, promoting recycling practices
> **Compositions considered:**
  
  - 80% Mixed Plastic + 20% Rubber
  - 80% Mixed Plastic + 20% CPLF
  - 80% Mixed Plastic + 10% Rubber + 10% CPLF

> **Increasing the percentages of rubber and CPLF result in defects:**
  
  - Rubber excess = Very flexible parts
  - CPLF excess = Difficulties in the production process
>**Process phases:**

1. Separation and sorting of materials
2. Granulation to 4 to 8 mm grains
3. Intrusion process (Kolbi method), combines extrusion technology with the injection method

>Production made at Extruplas, a Portuguese company

>Production dimensional limits:

- Profiles up to 3600 mm
- Thicknesses greater than 20-25 mm (square section) and 40 mm (circular section)
Ecovia – Demonstration Products

- **Fencing Posts**
- **Pathways for telematic sites**
- **Curbstone protectors**
Fencing Posts:

- **Objective:** replace the current wood posts used to limit the highway, keeping out strange elements from entering the road network
- **Dimensions:** $A = 180$ or $200$ cm and $B = 9$ cm
- **Weight:** 9-11 kg
- **Production:** Circular mould 90 mm diameter
Pathways for Telematic Sites:

- **Objective:** Replace the use of concrete pathways for telematic site maintenance operations
- **Dimensions:** 200x60 cm
- **Weight:** 59 kg
- **Production:** Profiles were made with intrusion moulds with the following sections: 80 x 80 mm and 40 x 90 mm
Curbstone protectors:

- **Objective:** Positioned on the curbstones beneath toll machines, in order to protect the vehicle door in case of an unintentional opening.

- **Dimensions:**
  
  - Ticket Dispenser: 100x9x2,5 cm
  - VMSA: 200x9x2,5 cm
  - Weight: 1.8 to 3.5 kg

- **Production:** Profiles built using intrusion molds with 90 x 25 mm section.
Ecovia – Installation Areas
"Green Stretch"
Fencing Posts:

- Not enough mechanical strength: wood posts used for shoring

- Density variations along each post, which implies the existence of areas with little mechanical resistance

- Posts support the barbed wire, but have less stability than the wood solution
Pathways for Telematic Sites:

- Fast installation process
- Number of pathways is highly dependent on local conditions of each telematic site
- Applicable in sites with moderate land slopes, which implies non-use in some situations
- Overall positive evaluation
Curbstone protectors:

- Easy assembly

- Possibility of local adaptation

- Material damping capacity should be increased
> Site http://www.ecovia.brisa.pt/

> Fairs and Congresses

> Brisa Sustenability Report

> Articles

> Magazine Inserts
Ecovia – Actual and Future Actions

> **Evaluate products performance**

> **Knowledge transfer**

> **Possible future products:**
  
  – Sound Barriers
  – Visual Barriers
  – Bases Flat Cones
  – Earth Retaining
  – Anti-Chaining Protector

> **Dissemination/Communication:**
  
  – Development of scientific articles
  – Project results dissemination
Ecovia – Conclusions

- Allows mutual knowledge of the entities involved
- Potential cost savings for the production stage
- Several environmental gains
- Consumption of waste materials that would go to landfill = 6 tons
- Knowledge dissemination
- Contribute to a sustainable business and society
We are on the right track

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