



## New biodegradable and compostable materials for the micro-irrigation extruded pipes and injected drippers (both flat and tubular).

### DESCRIPTION OF THE TECHNOLOGY

The present invention relates to AIMPLAS new **biodegradable and compostable materials** developed according to ISO 14885-1 (2005) and EN 13432 (2000), respectively, for the micro-irrigation extruded pipes and injected drippers (both flat and tubular).

The compound developed for the pipes has the following properties:

- It is processable in conventional extrusion pipe lines.
- It shows high thermal resistance (Vicat temperature higher than 100°C).

It shows good chemical resistance to fertilizers used during the irrigation

The compounds developed for the drippers:

- Show good weldability with the pipes.
- Have suitable fluidity to be injected.
- Show proper behavior for automatic demoulding in multi-cavity moulds.

The developed micro-irrigation systems (pipe + dripper) with a percentage of renewable sources higher than 70%, show properties comparable to the current polyethylene systems.

Link to DRIUS video:

<https://www.youtube.com/watch?v=XEw5IU1jB2A>.

### MARKET APPLICATION SECTORS

The obtained micro-irrigation systems with the new materials were validated in several crops in the South of Spain (Murcia), during a period of 6 months (May-November 2015). The studied region shows a very hot climate, especially in the summer season, where temperatures of 45-50°C are reached.

The micro-irrigation systems keep the properties (mechanical, internal pressure and dripping), after the exposure time of 6 months.

The developed compounds could be used in other agricultural applications or any other used, where high use temperatures are required (up to 100°C).

### TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

The advantages of the new micro-irrigation system are:

- An alternative for the current incineration and recycling processes, bearing in mind that the uncontrolled incineration is forbidden in the European Union (The Incineration Directive (Directive 2000/76/EC) (EN. 2000), and that the current plastic recycled product obtained is of low quality due to the high degree of contamination and degradation of those pipes mixed with soil residues, pesticides and fertilizers.
- An economic savings thanks to the disappearance of the separation/removing/recycling costs that equals to 1050€/hectare, approximately.
- Energy savings during the processing stage, since the pipes obtained with the new biodegradable & compostable materials need lower processing temperatures.
- The pipes, at the end of their life cycle, will be managed as any other organic waste, in an industrial composting plant, and the residue will disintegrate, in a period lower than 6 months, resulting in biomass, CO<sub>2</sub> and H<sub>2</sub>O.
- The new development provides an added valued product at the end of its life cycle, thanks to the compost generation.



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### **CURRENT STATE OF DEVELOPMENT**

The compounds obtained to manufacture pipes were validated at industrial level, by using the conventional polyethylene extrusion technology. The compounds for injected drippers were validated with industrial moulds modified according to the biodegradable material characteristics.

It would only be needed the usual optimization of the processing parameters to reach the required yield.

### **INTELLECTUAL PROPERTY RIGHTS**

The developed compounds within the framework of the EU project DRIUS '*Industrial implementation of a biodegradable and compostable flat micro-irrigation system for agricultural applications*', under the Innovation and Competitiveness European Programme (CIP/2007-2013), with the contract number ECO/12/332883 (<http://www.drius.eu/>), are AIMPLAS' property. When the project ended, AIMPLAS signed a 'Memorandum of Intentions', with the two participating companies in the project and interested in the exploitation of those compounds, to agree a series of preferential conditions for their manufacturing and selling, addressed to products within the agricultural sector (i.e. micro-irrigation systems). The exploitation of any other application/sector, different from the one established in that Memorandum, is available to any other interested company and should be negotiated directly with AIMPLAS.

### **COLABORATION SOUGHT**

Companies interested in the following systems of cooperation:

- Agreement about development license to implementation and to use of technology, respecting the agreements already reached with the two ones involved in the project.
- Agreement about Research & Development projects (technical cooperation) to apply technology in different sectors.

### **RELATED IMAGES**





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