

BIODEGRADABLE NETS FOR PACKAGING AGRICULTURAL AND SHELLFISH PRODUCTS.

In the framework of the ECOBIONET Project¹, which ended on 31/08/2013, after a 3-year period of development, AIMPLAS and the rest of the consortium partners have obtained new grades of biodegradable materials processable in conventional extrusion equipment EMS (Extrusion Melt Spinning), to manufacture different types of nets and pack agricultural and shellfish products.

The main achievement of the project is those new grades of plastic materials to obtain 100% compostable packaging nets. Due to their compostability, the nets can be disposed in the organic waste containers both at home and industrial level. This fact shows the following advantage: if the packed product reaches its expiry date or it is rotten, the whole packed product (product plus packaging net) can be thrown away without an additional separation stage, bringing it to the composing plant to obtain “compost” which will be used as fertilizer for the plants.

Currently several types of nets non-oriented and oriented can be obtained with the EMS process more or less ‘dense’, depending on the number of threads that the net is made up of and the geometric shape that their joint forms.

The **non-oriented nets** are the most common and are used to pack citrus fruits, potatoes and a great deal of agricultural products. One specific type of these non-oriented nets is the ‘combined-nets’, which are packaging for the same agricultural products made up of plastic film bags with ‘windows’ of different sizes. The latter packaging product has the advantage of being ‘breathable’ and letting see the product easily. Moreover, if the product originates any kind of waste, e.g. dust in the case of the potatoes or pieces of skin in the case of the onions and garlics, that waste will remain inside the packaging, preventing the shelves and ladders getting dirty.

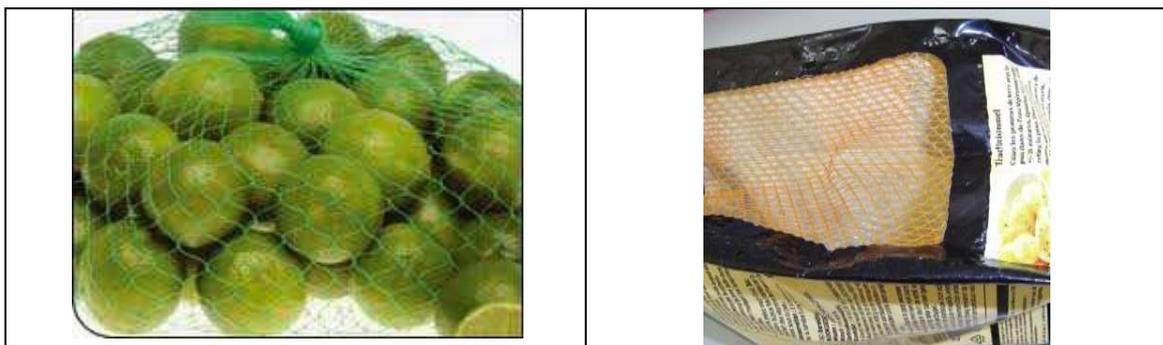


Figure 1. Packaging with non-oriented nets (standard and ‘combined’).

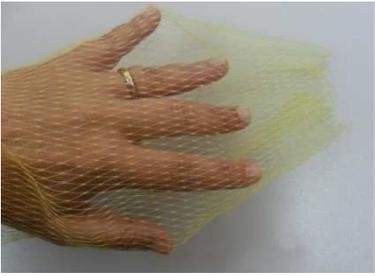
An additional stage is needed to manufacture the **oriented nets** after obtaining the net, where it is heated and stretch again. The fundamental characteristic of this type of net is its flexibility, to be stretched during the packing process and afterwards to recover the initial shape, compacting the packing product during its shelf life. It is the case of the garlics and shellfish products as well as molluscs.



Figure 2. Packaging with oriented nets.

The obtained nets with the new materials developed in the ECOBIONET Project can replace the current nets, being impossible to differentiate between them at a glance and fulfilling all the mechanical and functional requirements.

The following table shows the characteristics of these biodegradable nets in comparison with the conventional nets.

	Material	Weigh (g/m)	Tensile strength (N)	Elongation at break (%)
ORIENTED NETS for garlics and onions.	Traditional	14.5-15.5	145-155	
	AC16040	16.5-17.5	330-350	
ORIENTED NETS for shellfish products.	Traditional	32-34	170-180	
	Material Bio AC 16040	34-35	50-55	
NON-ORIENTED NETS, conventional and combined.	Traditional	8.5-9.5	560-580	
	Material Bio AD 16040	23-24	560-585	
	Material Bio Arboblend SC2305TE(*)	17	550	

(*)Material for combinets or conventional nets, with weight less than 2 kg.

Additionally, for 2 of the new biodegradable plastic materials, an official certification has been obtained according to EN 13432 (2000) 'Requirements for packaging recoverable through composting and biodegradation - Test scheme and evaluation criteria for the final acceptance of packaging' by a recognised certification institute such as Vinçotte, in Belgium. This standard defines the requirement for organic waste packaging under industrial composting conditions, as well as biodegradation and environmental security aspects.



Figure 3. Seedling logo certificates, by Vinçotte, obtained under the ECOBIONET Project for two of the formulations developed by AIMPLAS (AC 16040 y AD 16040)

The consortium of this project is composed of 3 companies TECNARO (Germany), CRISTOBAL MESEGUER (Spain), ECOPLAS (Spain), as compounder and packaging manufacturers for agricultural and shellfish products and two technological centres AIMPLAS (Spain) y OWS (Belgium), to develop the materials and evaluate their compostability, respectively,

ⁱ This project receives funding from the European Community's Competitiveness and Innovation Framework Programme (CIP/2007-2013), under grant agreement ECO/09/256032/SI2.566276. The information reflects the consortium view and the Community is not liable for any use that may be made of the information contained therein.