

NEW PROCEDURE FOR THE ELIMINATION OF PRINTED INK FROM PLASTIC FILM

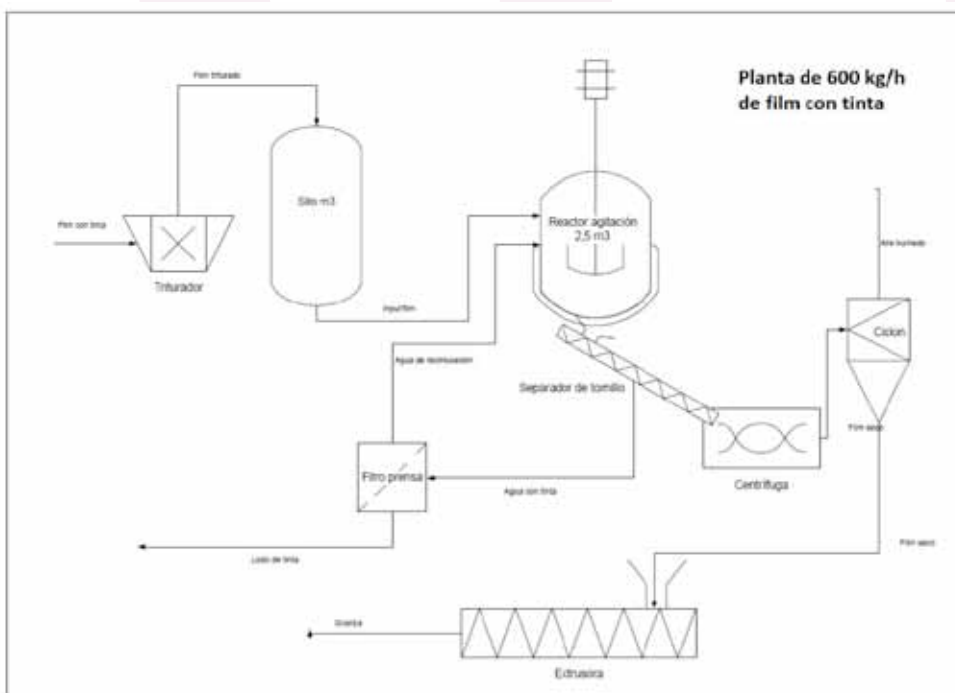
TECHNOLOGY DESCRIPTION

The printing of flexible packaging consists of applying a liquid ink to a plastic film. After drying, the printed film is ready to be used as packaging for various products. Some of the most common plastics used are polyethylene (PE), polypropylene (PP) and polyester (PET).

During the printing of flexible packaging it is normal to adjust the parameters of the printing machine, as well as the different colours used, to achieve a print of the required quality. The plastic film moves through the printer at high speeds, so large amounts of plastic of inferior quality is also produced. Most of the waste is generated in this part of the process, incurring losses between 5 and 10% of the total production.

At present, this kind of material is recycled without eliminating the ink. A coloured film of low quality and value is obtained, which is normally used in basic applications such as rubbish bags. Also, because the increase in raw material costs, it is becoming urgent a better use of waste to reduce production costs.

The process developed by the Waste, Pyrolysis and Combustion Group from University of Alicante offers a global solution for this problem by removing the ink from the plastic film using different physical and chemical treatments. We obtain a pure, high-quality ink-free product available for recycling in a wide variety of applications.



Scheme of a possible processing plant

The process proposed by the research group consists of various steps. First, the material is prepared and milled to the correct size for cleaning. Next, the ink is removed in cleaning tanks. The milled material is transferred to the tank, where water and cleaning agents are added.

During the process the ink is extracted continuously by a current of water that contains the cleaning solution and the ink. From this point onwards, different parallel steps are followed: the film is washed and dried while the cleaning solution and the pigment are recovered.

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In the fourth step, the milled and treated film is soaked in a washing tank to completely remove the final remains of the ink and cleaning solution. Then the ink and the cleaning solution are separated in two flows. The latter can be reused in the process and the former can be treated for the recovery of pigment. In the sixth stage the pigment is recovered by heating the ink. Finally, the film is dried after the washing phase to obtain a high quality plastic that can be reused as a raw material.



Results on different samples

APPLICATION SECTORS

The technology is applicable to the removal of printed ink on plastic films and subsequent recycling.

Some of possible interest sectors:

- Plastic recycling
- Printing industry
- Packaging

TECHNICAL ADVANTAGES AND INNOVATION

The technology offers the following advantages and benefits:

- The process obtains an ink-free plastic film which can easily be transformed into a new raw material for processing.
- The process increase the value of treated plastic achieving a quality similar than pure.

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- The industrial process is economically viable because the value of the recovered material is increased.
- The process also recovers pigments that can be reused, so the waste generated is a minimum.
- The process for the removal of the ink is completely innovative and ecological, because it doesn't use organic solvents.
- The technology has been successfully tested on different plastics, such as Polythene, Polypropylene, Polyester and Polyamide. It is viable for both water and solvent based inks.
- The technology can be applied either to waste coming from end user or from production losses.

CURRENT STATE OF THE TECHNOLOGY

The process has been successfully tested in a pilot plant. Some deinking tests on different substrates such as Polyethylene, Polypropylene, Polyester and Polyamide have been carried out. The process is feasible either solvent based inks or water based inks

INTELLECTUAL PROPERTY RIGHTS

The technology is protected by the following patent application

- Title: "New procedure for the elimination of printed ink from plastic film"
- Application number: 201200320.
- Date of application: 26/03/2012.

Also, a PCT application has been filled for international extension.

COLLABORATION SOUGHT

We are looking for companies interested in:

- License agreement for technology exploitation.
- Agreement for R&D project (technical cooperation) to complete the development of technology or application to other sectors.

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