Life-Recumetal

“DEMONSTRATION OF THE RECOVERY OF CRITICAL METALS SUCH AS INDIUM AND YTTRIUM BY RECYCLING DISCARDED FLAT PANELS”

LINE OF MECHANICAL PROCESSING OF FLAT SCREENS

The constructed mechanical processing line consists of two modules. In the first one (Module I), a manual disassembly of the simplest components is carried out, and in the second one (Module II), the rest of the screen that has not been disassembled in Module I is automatically processed into two stages: (1) size reduction, mercury removal and sieving, and (2) magnetic separation.

In the **Module I,** a manual disassembly of the main components of the screen is carried out: plastic and metallic components (housing, foot, frame, etc.), glass sheet, PMMA front sheets, PET sheets, printed circuit boards (PCBs), cables and loudspeakers among others. Through module I we obtain specific materials such as iron, aluminum or recyclable plastics by traditional methods and also, another fraction, glass sheets (LCD panel) with high content of key metals which will be extracted later in the chemical treatment line.

The **Module II** is responsible for automatically processing of the part of the flat screen (screen module) that has not been manually dismantled in Module I, approximately 40% by weight of the total screen. Through crushing, mercury removal, sieving and magnetic separation processes we obtain different fractions: fraction of glass powder (FP) from the crushing of mercury lamps, magnetic fraction (FM) composed of ferrous metals and non-magnetic fraction (FNM) composed mainly of plastics, aluminum and copper. The fraction of glass powder (FP) together with the LCD panels obtained in Module I, will be the fractions from which we will later extract the Indium (In) and Yttrium (Y) in the chemical treatment plant to be developed.

The mechanical pilot line for the recycling of flat screens is currently in the facilities of Ecointegra (Aoiz). The design, development and construction of the mechanical processing line have fulfilled the technical requirements established at the beginning, which has enabled the semi-industrial validation of the pilot line. The mechanical processing line has a processing capacity of more than 200 kg screens per hour. From the processing of these screens we get around 80% of fractions such as iron, aluminum, plastics and other components recyclable by traditional methods, 13% of LCD panels from which later extract Indium, and 2% of glass powder from which later extract Yttrium.

The future industrialization of the mechanical processing line will offer the possibility of effectively recycling a hazardous waste that currently only a third part is managed according to European directives, and will offer also the possibility of recovering fractions such as the mentioned critical metals that may be subsequently reused in other industrial applications.

Módule I

Módule II

PARTNERS

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STARTING DATE: September 2015
DURATION: 42 months
BUDGET: 881.520 €

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ecointegra

INGENIERÍA NAVARRA MECÁNICA

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