PROJECT OBJECTIVES

Existing sorting technologies for non-ferrous fractions do not allow separation of materials with similar composition and properties (colour, density, etc). They also suffer from poor cost effectiveness and/or throughput for the separation of aluminium (Al) and magnesium (Mg) alloys.

To overcome these limitations, the project will:

- Develop a new sensing approach based on Electromagnetic Tensor Spectroscopy (EMTS) and Vision Image Analysis (VIA), to probe the electrical properties of non-ferrous metal fraction to identify and sort into 3 streams: “white” metals (Al and Mg), “yellow” (brass and bronze), and “red” (Cu).

- Develop a two-step Laser Induced Breakdown Spectroscopy (LIBS) sorting technology, to firstly separate Cast Al, and then to separate wrought Al, and high value cast Mg and wrought Mg alloys.

PROJECT PARTNERS

www.lenz-instrumentes.com
www.iccom.cnr.it
www.tecnico.ulisboa.pt
www.regulator-cetrisa.com
www.manchester.ac.uk
www.joanneum.at
www.lneg.pt
www.saubermacher.at
www.marwan-technology.com
www.monocrom.com

Contact: info@shreddersort.eu

Selective recovery of non-ferrous metal automotive shredder by combined electromagnetic tensor spectroscopy and laser-induced plasma spectroscopy

Funded by the European Union
FP7-ENV-2013-603676
THE CHALLENGE

End-of-life vehicles (ELV) generate around 10 million tonnes of waste per year in the EU.

Around 75% of ELV materials are currently recycled or recovered by different processes, but this percentage falls short of the 95% target for 2015 set by the ELV European Directive 2000/53/EC. The non-ferrous metal fraction in ELV scrap contains several metals/alloys; primarily aluminium (Al), copper (Cu) and magnesium (Mg). Mg is a critical metal in Europe, whose recovery is important for environmental, economic and resource conservation reasons. The separation of non-ferrous metals from ELV scrap is technologically complex, and the limitations of existing waste separation technologies result in the use of labour-intensive handpicking separation, which is only viable in low labour cost countries, and results in the loss of important raw-material for Europe.

EXPECTED RESULTS

The ShredderSort project will provide new technologies for the separation of the heavy and light fractions of non-ferrous ELV scrap. The project will contribute to:

- Efficient resource management by promoting metal recycling rates, avoiding Al/Mg downcycling and reducing metal recycling costs.
- Development of new business models and employment opportunities arising from these new recycling technologies.
- Reduced European dependence on raw-material imports, especially of critical metals such as Mg.
- Promotion of energy efficiency in the metallurgical industry.
- Reduced environmental emissions and impacts.

SHREDDERSORT CONCEPTUAL DIAGRAM

[Diagram showing the separation process from ELV to individual metal fractions.]