

**Fast X-ray Sorting for Recycling Light Metals:
A Low Cost High Throughput In-Line X-Ray Fluorescence Scrap Metal Sorter**

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Once automobiles have reached their end of life, they are sent to scrap yards where the entire automobile is shredded by a hammer mill into small size scrap pieces and then separated into size fractions, between one and five inches. After shredding of the automobile into scrap pieces, the recycling process begins. Current methods for recycling in the US include separation of Zorba and Twitch fractions. Zorba is composed of non-ferrous metals, plastic, wood, rock and glass. The twitch fraction is currently the highest level of separation performed in the US for light metals and consists of many different aluminum alloys, including both cast and wrought aluminum alloys, which are expensive and difficult to separate.

Cost effective separation and recycling of the different alloys could dramatically reduce the cost of light metals and lower the environmental impact of manufacturing with them. To be commercially attractive the sortation of aluminum alloys should be able to achieve a rate of 10 pieces of scrap per second, and the sorting should cost less than 2 cents per pound of accurately sorted material.

To overcome the challenges associated with recycling aluminum alloys present in automotive scrap streams, UHV has developed a low cost high throughput in-line x-ray fluorescence scrap metal sorter. This instrument was designed for sorting pre-and post-consumer aluminum scrap alloys in addition to sorting twitch, Zorba, other metals and materials. The speed of the sorting along with the low cost of the instrument allow commercial feasibility of recycling aluminum alloys in the US which are generated from automotive scrap streams. Several of these instruments deployed in the US are able to meet the annual demands of aluminum scrap production in the US.

UHV has demonstrated greater than 95% accuracy for sorting Cast, Wrought, and Zorba. Results from the work to date on this XRF technology will be presented in this paper.

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