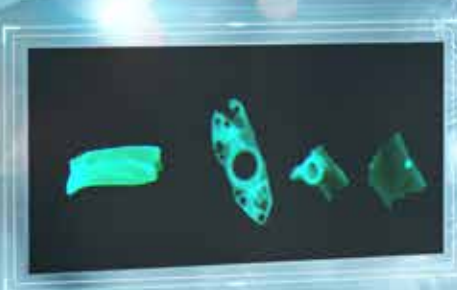
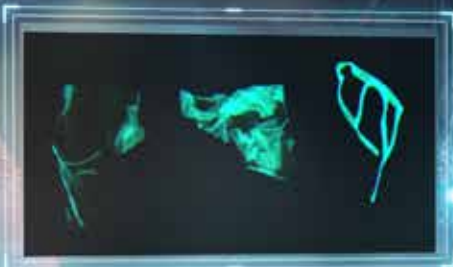


SGM XRF-T X-RAY FLUORESCENCE COMBINED WITH TRANSMISSION

A New Technology
for Better Separation of Heavy Metals

Combines the X-Ray Fluorescence surface analysis with
the X-Ray Transmission pass-through analysis.

Patent Pending PCT/IB2023/052302



BENEFITS OF THE SGM XRF-T

- Use of the latest XRF technology for the separation of heavy metals from each other (Cu, Zn, Cr, Pb) including metal alloys like brass, bronze and 316 series stainless steel from 306 and 304 series.
- Use of the latest XRT technology to segregate wrought aluminum from heavy metals as well as from light Magnesium alloys (main additional made of Al) and heavy aluminum cast alloys (main additional made of Cu and/or Zn).
- Use of an extra powerful X-Ray source to better overcome potential inaccuracies in the XRF analysis resulting from paint coating and/or presence of dust on material.

EXCLUSIVE BENEFITS

- Ability to identify aluminum breakages and sort them out along with heavy metals.
- A single separator with the ability to separate light metals utilizing XRT technology and separation of heavy metals combining XRT and XRF technologies. When using just XRF for light metals, XRF considers as light metals all what is different from heavy metals which is not accurate as inbound material can still hold aluminum breakages and residual non-metallic contaminant.
- Using XRT for light metals is also the most productive solution because of the higher resolution that XRT technology features versus XRF.



THE TECHNOLOGY

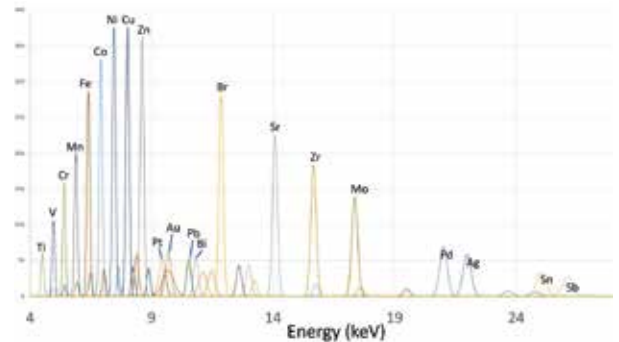
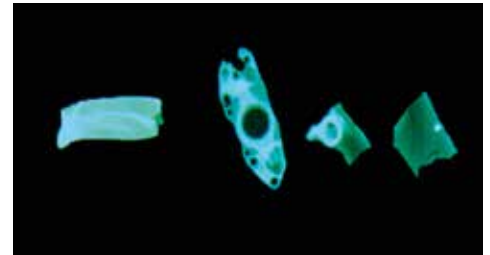
Unlike the X-Ray Transmission technology, the X-Ray fluorescence technology is not an imaging technology which means it does not produce images of the single pieces of metal processed, but indicates the presence, concentration and nature of heavy metals.

XRF requires an additional “imaging” technology to be able to relate the information obtained by the XRF to the single pieces being analyzed which in turn produces a target to fire on by the pneumatic rejection system.

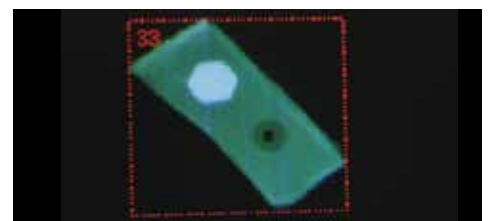
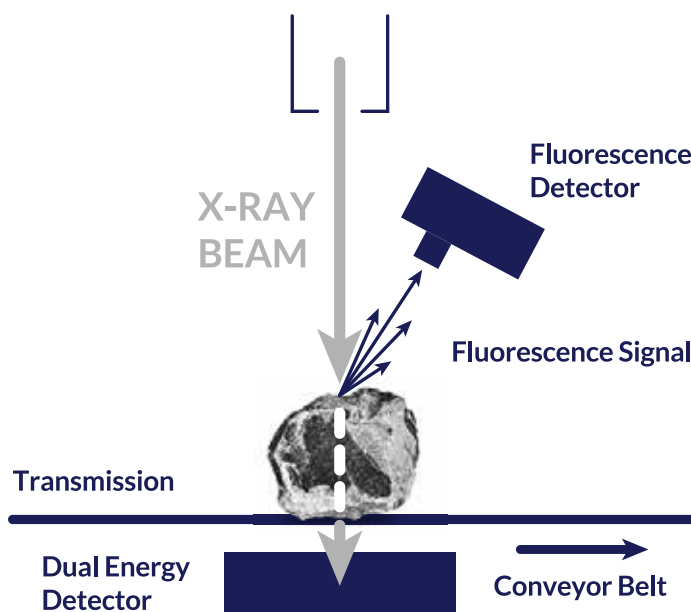
Traditional X-Ray Fluorescence sorters work in combination with either cameras or 3D laser scanners. This combination provides imaging information on the shape of single pieces processed, but not on the chemical nature of their inner content.

The proprietary SGM XRF-T response to the limitation of sole imaging technologies by adding to the image of single pieces, information on the composition of their inner content.

The SGM XRF-T identifies and sorts aluminum with heavy metals in or attached to them.



OPERATING PRINCIPLE OF THE XRF-T



X-RAY TRANSMISSION

The X-Ray's primary source emits radiation that can be totally, partially or very little absorbed by the single elements they bomb. The level of absorption depends on the density and thickness of each chemical element. By measuring the residual radiation that passes through a single piece with a dual bank of XRT sensors of different energies, it is possible to identify the density of a piece regardless of its shape.

THE SGM XRF-T combines in one sorter, two technologies using one X-Ray source and both XRF and XRT sensors.



Aluminum breakages

X-RAY FLUORESCENCE

An X-Ray source emits high energy photons called ionizing radiations that move electrons of the atoms pieces they bomb from one energy orbit level to another. The atoms are called excited which lasts a short time as nature turns them back to their original lower energy, stable configuration. The photons emitted from the source are called the "primary X-Ray beam".

In the passage between the two energy levels, atoms emit a photon with energy equal to the difference in the energies of the two levels, excited and stable. The process of the emission of this photon is called *fluorescence* and the energy level given by the difference of the two energies is specific to each chemical element. Heavy metals are characterized by fluorescence photons with such energies that they can be sensed by specific XRF sensors (SDD) which identify their chemical nature and concentration.

ASR ZORBA



ASR ZEBRA



ASR ZURIK



TECHNICAL SPECIFICATIONS

The SGM XRF-T is specifically suited for operators with small and medium quantities of material to process; as with one SGM XRF-T, they can save on the more expensive investment of two separate sorters XRT + XRF.

Metals can be sorted with a recovery of over 90% and purity over 98%.

- Operating conditions: Indoor or outdoor if roof covered and temperatures from 5°C to 35°C / 41°F to 95°F.
- X-Ray radiation level: <1 µGy/h at 5cm/2".
- Capacity: Based on application, percentage of material pieces to sort out, their average size and weight.
- Air compressor: Specifications based on quantity and characteristics of material to sort out.

PRODUCT HIGHLIGHTS

- Self-learning software.
- Extremely robust design to suit industrial use
- SGM tailor designed software based on customer specific application.

It is recommended the customer set up internet connection to the SGM XRF-T to allow SGM technicians to perform software updates, new set ups and service intervention from remote.

TYPICAL APPLICATIONS

- ASR Zorba: Sorting of Aluminum wrought
- ASR Zebra: Sorting of heavy metals between them
- ASR Zurik: Sorting of stainless steel series 316 for the 306

MODEL	ACTIVE WIDTH	VALVES	SOURCES	BELT SPEED	CAPACITY (*)
XRF-T 32	812 mm - 32"	92	1	2,5 m/s - 8 ft/sec	2-4 t/h
XRF-T 64	1625 mm - 64"	184	2	2,5 m/s - 8 ft/sec	4-8 t/h

* Depending on application, material specific weight and metal content material.



LIGHT METALS

WROUGHT ALUMINUM



HEAVY METALS WITH ALU BREAKAGES

BRASS
COPPER
STAINLESS STEEL
ZINC

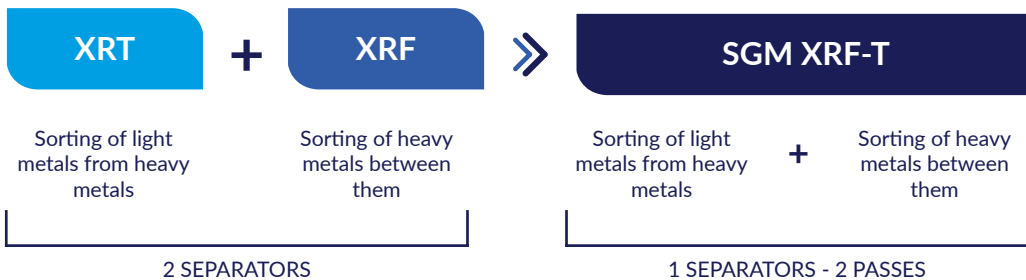




-  **69** Years in business
-  **9** Fully owned subsidiaries
-  **2** Manufacturing and repair facilities

CUSTOMERS WHO WOULD BENEFIT FROM THIS COMBINED TECHNOLOGY

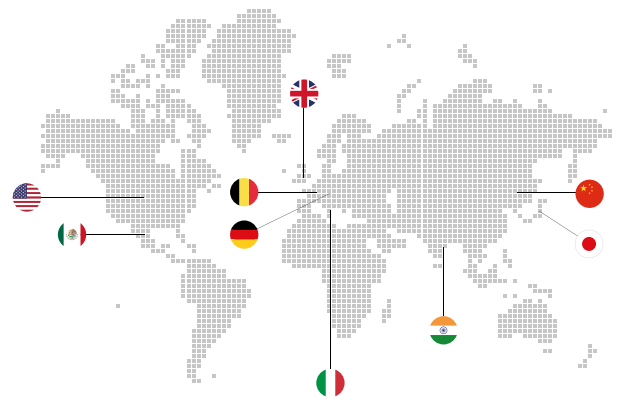
The SGM XRF-T is specifically suited for companies with small and middle quantities of material. Combining two technologies in one sorter is less expensive than two separators with two different technologies.



SGM WORLDWIDE

Always available, near you, in your language.

The SGM business model is based on providing technological expertise, staying close to its customers through a network of SGM Magnetics corporations located in Italy, Germany, UK, Belgium, USA, China, Mexico, India and Japan, as well as a few long standing agents with extensive experience in the SGM products and technologies.



The **BEST SOLUTION** is often a combination of **BEST TECHNOLOGIES!**



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