

X-RAY TRANSMISSION

X-RAY SORTER Model XRF-T

TECHNICAL SPECIFICATIONS

The SGM XRF-T combines the X-ray Fluorescence surface analysis with the X-ray Transmission pass-through analysis. The XRF technology allows for the sorting of heavy metal pieces between them (Cu, Zn, Cr, Pb,...) including metal alloys like brass, bronze and 316 series stainless from 306 series. The SGM proprietary use of XRT in combination with the XRF technology allows to provide not only an image and shape of every single piece analyzed but also information on the metal composition of their inner content which allows for the identification of possible aluminum breakages and sort them out along with the heavy metals.

ALUMINUM WITH PIECES OF HEAVY METALS IN THEM OR STILL ATTACHED TO THEM



The SGM XRF-T combines the two technologies in one sorter using one sole X-ray source and both XRF and XRT sensors, therefore taking advantage of the complementary information of the two different technologies.

The X-ray fluorescence process consists in an X-ray source that emits some high energy photons called ionizing radiations to the extent that they are able to move electrons of the atoms of the pieces they bomb from one energy orbit level to another higher one. In such a situation, the atoms are called excited but such situation only lasts for a very short time as nature makes that the atoms tend to turn back to their original lower energy configuration called stable. The photons emitted from the source are called the "primary X-ray beam". In the passage between the two energy levels, every atom emits a photon whose energy is equal to the difference in the energies of the two levels, excited and unexcited. 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, Silicon Drift Detectors) which

identify their chemical nature and concentration.

With the X-ray Transmission process, the radiations emitted by the X-ray source are either totally, partially or scarcely absorbed by the material pieces they bomb. The level of absorption depends on the density and thickness of the chemical element each material piece is made of. By measuring the residual radiations that pass through every material piece with a dual bank of XRT sensors (scintillators) of different energies, it is possible to identify their density regardless of their thickness.

The combined information collected by the XRF and XRT sensors is processed by a computer that decides whether or not to trigger a pneumatic sorting device. The software allows the operator to choose from a variety of sorting recipes and an interactive display interface allows for simple intuitive setups. Possibility for the SGM XRF-T to run first just the XRT process for the separation of the light metals followed by the XRF process combined with XRT for the separation of the heavy metals between them. Indeed, using XRF for light metals is not optimum as XRF does not see light metals and considers as light metals all what is different from heavy metals which is not accurate as inbound material can hold aluminum breakages and residual non-metallic contaminant. Using XRT for light metals is also more productive because of the higher resolution that XRT technology features versus XRF.

PRODUCT HIGHLIGHTS

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

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

MODEL	VALVES	SOURCES	BELT SPEED	CAPACITY (*)
XRF-T 32	92	1	2,5 m/s - 8 ft/sec	2-4 t/h

(*) Depending on application, material specific weight and metal content in material

MODEL	LENGTH	WIDTH	HEIGHT	WEIGHT
XRF-T 32	6610 mm - 260"	1830 mm - 72"	2160 mm - 85"	6,000 Kg - 13,228 lbs

X-RAY SORTER - Model XRF-T

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.



The SGM XRF-T is specifically suited for operators with small and middle 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.
- X-ray radiation level: <math><1 \mu\text{Gy/h}</math> 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.

