



REDWAVE XRF
METAL SORTING
Plant Solutions &
Sensor-Based Sorting Systems

RECYCLING



Maximum End-Product Purity

METAL SORTING For the Recovery of High-Value Metal Fractions

APPLICATIONS

Recovery of:

- » Nonferrous metals (aluminum, copper, brass, bronze, zinc, stainless steel, etc.)
- » Precious metals (gold, silver, copper, etc.) from slags from waste incineration plants and other ashes
- » Precious metals (gold, silver, copper, etc.) from various scrap metals

Sorting of:

- » Various aluminum alloys containing copper and zinc in varying concentrations
- » Various stainless steel alloys (based on nickel and molybdenum, etc.)
- » Various copper alloys (brass, bronze, copper-silver alloys, etc.)
- » Nonferrous metals
- » ZORBA
- » ZURIK








APPLICATIONS

- » Sorting of shredded end-of-life-vehicles
- » Sorting of shredded white goods
- » Recycling of slags and ashes
- » Sorting of various shredded nonferrous (= ZORBA, ZURIK and others)
- » Recovery of meatballs from scrap metal
- » Recovery of precious metals and refractory metals from scrap metal and residues from combustion
- » Sorting of stainless steel:
 - » Separation of impurities such as copper, tin and others
 - » Separation of nickel containing and nickel free stainless steel
 - » Separation of molybdenum containing and molybdenum free stainless steel
- » Sorting of aluminum alloys containing copper and zinc in varying concentrations
- » Separation of aluminum from heavy metals
- » Colour-independent sorting of various heavy metals in clean fractions



SORTING FLEXIBILITY

				
ZORBA	ZEBRA	TWITCH	ZURIK	IBA
<ul style="list-style-type: none"> » Sort into Heavy Metals: (Zebra) and Aluminium (Twitch) » Removal of PCB's (printed circuit boards) 	<ul style="list-style-type: none"> » Sort into Individual Metals: (Copper, Zinc, Brass, Bronze, Stainless Steel, PCB's, and more) 	<ul style="list-style-type: none"> » Sort into various Aluminium Grades » Removal of PCB's (printed circuit boards) 	<ul style="list-style-type: none"> » Sort into Clean Stainless Steel and Waste » Sort Stainless Steel into Alloys 	<ul style="list-style-type: none"> » Recovery of Precious Metals: Gold, Silver, etc. » Sort into Individual Metals: (Zinc, Copper, Brass, etc)



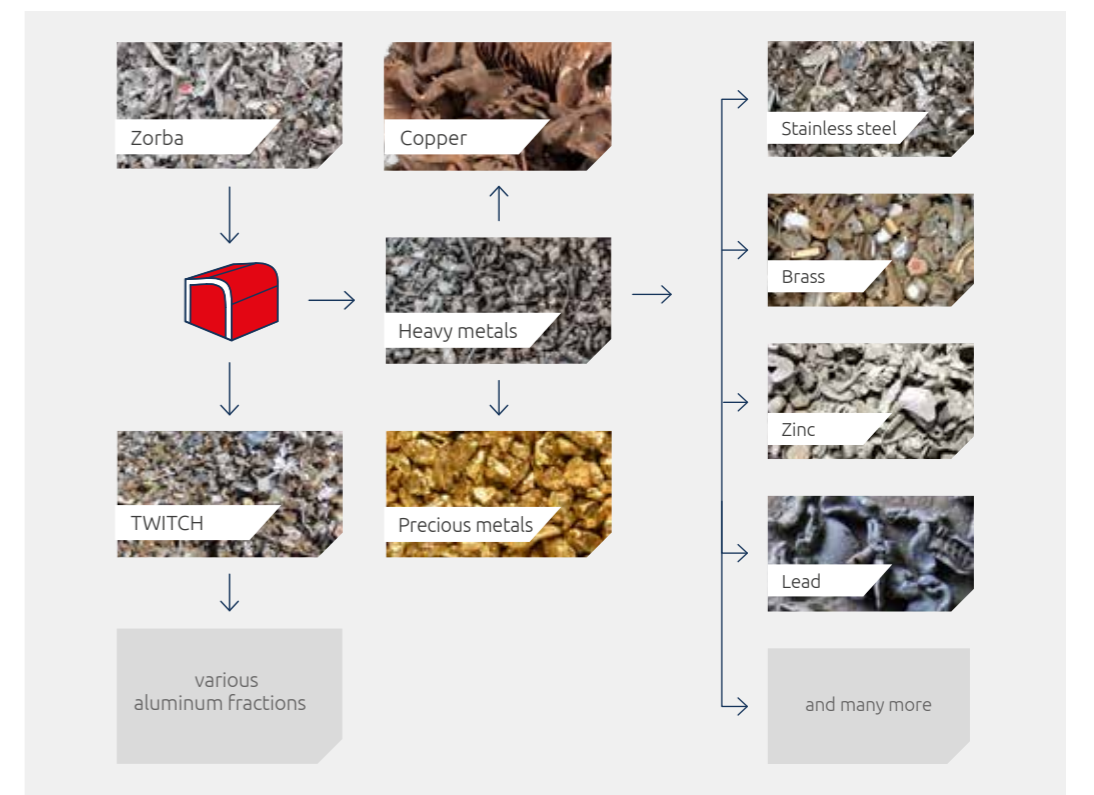
BIRCH/CLIFF

- » Sort into Furnace Ready Copper
- » Removal of Tin, Silver, Nickel and other impurities



BFR

- (brominated plastic)
- » Removal of Bromine and Antimony





METAL SORTING

One Machine for All Applications

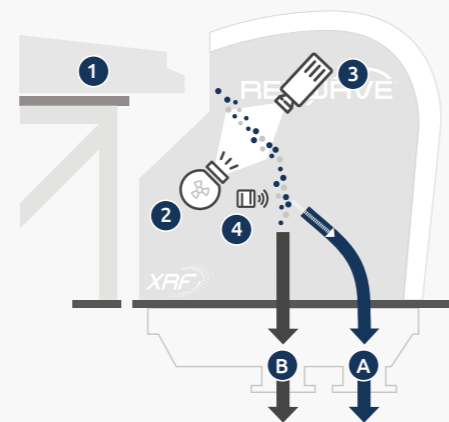
REDWAVE sorting technology has been a leader in XRF (X-ray fluorescence)-based sorting systems from the very beginning. Our global customer base ranges from family-owned shredding operations to multinational corporations. Each of our clients has successfully addressed their specific requirements in non-ferrous metal sorting with REDWAVE XRF.

“Our technical expertise, combined with close collaboration with our customers, has continuously driven innovation in the development of new sorting solutions.”

Service-Optimised & Maintenance-Friendly

- » Maintenance-friendly design, optimised for easy accessibility and rapid service interventions
- » Quick and straightforward belt replacement

Functional principle 2-way slide system



- 1 Vibratory Feeder
- 2 Sensor with x-ray tube and detector
- 3 Camera unit
- 4 Valves and nozzles
- A Eject
- B Pass

REDWAVE SORTING MACHINES

REDWAVE BELT SYSTEM

Optimal for small and rolling parts (from 4 to 25 mm)

Uniform conveyance prevents changes in speed or position of the parts, allowing for accurate sorting.

The new and innovative REDWAVE belt prevents material from snagging.

The trajectory is controllable and remains constant, which ensures accurate sorting.

- » **Highest precision and performance for sorting fine, small, and round parts**

VS

CHUTE SYSTEM

Optimal for large parts (from (10) 15 to 180 mm)

Controlling the slippage of small parts is challenging. Frequent changes in speed and position can reduce the quality of the final product or output rate.

Due to humidity and dirt fine materials may stick to the chute.

The trajectory of small materials changes and is unpredictable making precise sorting difficult.

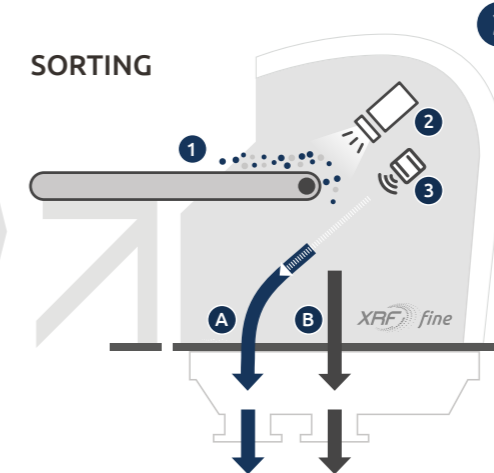
- » **Highest precision and performance for sorting coarse material.**

APPLICATIONS

INPUT

- » ZORBA
- » Heavy Metals
- » IBA
- » ZEBRA
- » Cliff/Candy
- » TWITCH

SORTING



OUTPUT

- » Copper
- » Precious metals
- » Brass
- » Zinc
- » Bronze
- » Stainless steel
- » Various aluminium grades
- » Etc.

Technological Highlights

- » Innovative in-house REDWAVE sensor-technology
- » Enables higher purity and efficiency for fine material sorting
- » Incorporates the most advanced sensor technology with a significantly larger number of sensors, resulting in higher scan rates, resolution and precise detection of fine materials
- » Utilises an increased number of energy-saving, high-speed valves for the most efficient metal sorting
- » Delivers a higher recovery rate for precious metals
- » State-of-the-art belt system specifically designed for fine, small and round materials (from 4 mm)
- » XRF sensors with simplified object recognition via laser support

1 Acceleration belt

2 Sensor unit with X-ray tubes and detectors

3 Valve units for material ejection

A Eject

B Pass





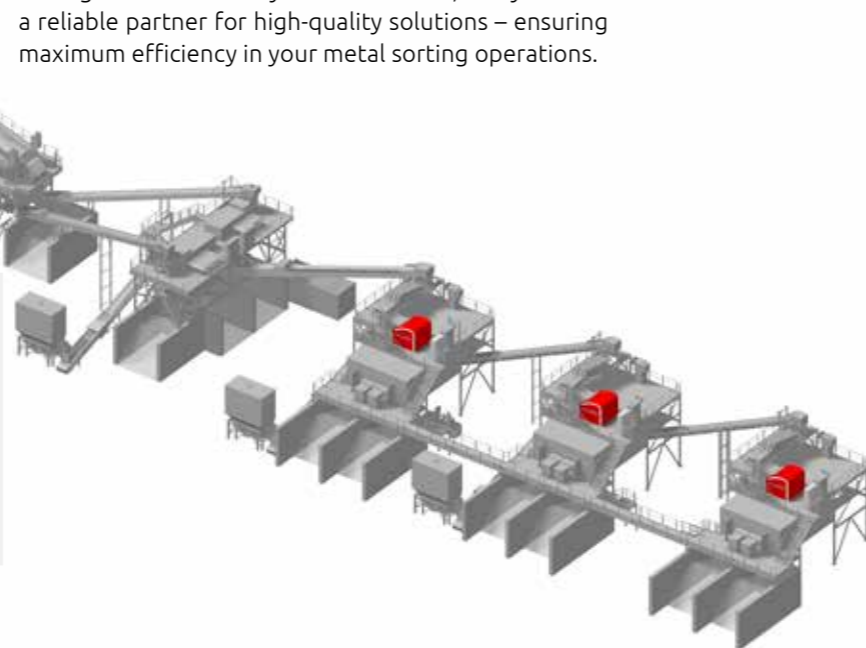
PLANT SOLUTIONS for Metal

BT-Systems brings over 40 years of experience in plant engineering.

BT-Systems not only supplies sensor-based sorting machines but also delivers complete turnkey sorting plants. From initial consultation and engineering through to full assembly and installation, BT-Systems is a reliable partner for high-quality solutions – ensuring maximum efficiency in your metal sorting operations.

Plant Design

- » Process engineering
- » Profitable end-to-end solutions
- » 40 years of experience
- » Highest quality standards from a single point of contact and supplier



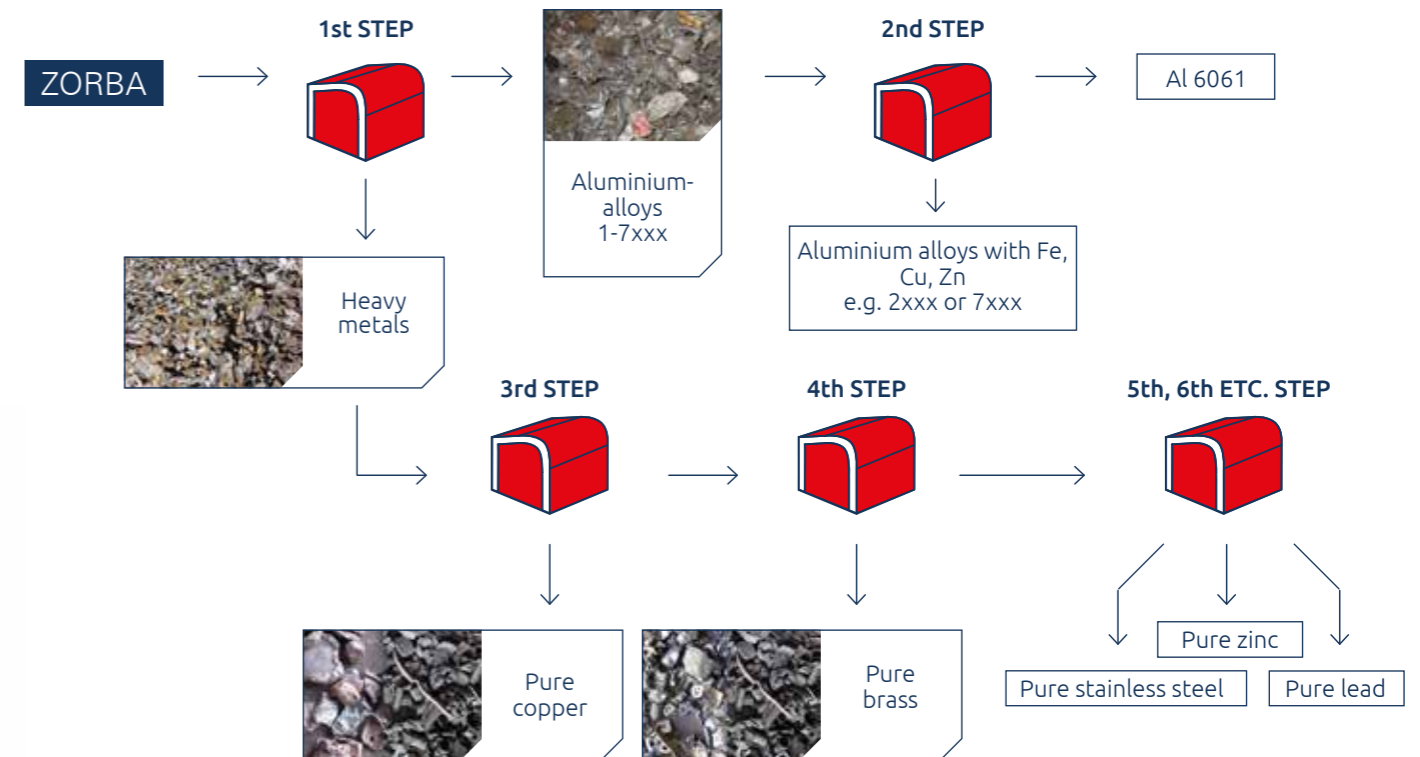
INPUT MATERIAL	ZORBA, ZEBRA, TWITCH, ZURIK, BIRCH/CLIFF, IBA, etc.				
PREPARATION	Material handling equipment <ul style="list-style-type: none"> ▪ Bunkers ▪ Conveyors ▪ Feeders 	Magnet <ul style="list-style-type: none"> ▪ Barroferit ▪ Neodymium 	Screening <ul style="list-style-type: none"> ▪ Flip-Flow ▪ Linear ▪ Drum screen 	Eddy current separator <ul style="list-style-type: none"> ▪ Centric ▪ Eccentric system 	Windshifting <ul style="list-style-type: none"> ▪ Zig-zag separator ▪ Cross-flow sifter
SORTING STEPS REDWAVE XRF/C	ZORBA/ IBA (Incinerator Bottom Ash) <ul style="list-style-type: none"> ▪ Lights vs. Heavies (ZEBRA vs. TWITCH) 	Heavy metal Mix <ul style="list-style-type: none"> ▪ Free Zinc, Copper ▪ Stainless Steel ▪ Brass/Bronze ▪ Precious Metals (Au, Ag, ...) ▪ Lead, etc. 	ZURIK <ul style="list-style-type: none"> ▪ Free Stainless Steel 	Stainless Steel <ul style="list-style-type: none"> ▪ 304 Series ▪ 316/317 Series ▪ 2XX, 4XX etc. 	Aluminium (TWITCH) <ul style="list-style-type: none"> ▪ High Cu/Zn Alloys ▪ Medium Cu/Zn Alloys ▪ Low Cu/Zn Alloys
QUALITY CONTROL	REDWAVE mate - process monitoring and plant control system. Continuously generating statistical data from material.				

FINAL PRODUCT



Free Zinc, Copper, Stainless Steel, Brass/Bronze, Precious Metals (Au, Ag, ...), Lead, etc., Stainless Steel Series, 316/317 Series, 2XX, 4XX, etc., Aluminium (TWITCH), High Cu/Zn Alloys, Medium Cu/Zn Alloys, Low Cu/Zn Alloys

SAMPLE FLOW SHEETS



BT-Systems is an international mechanical engineering and automation company and offers system integrations for innovative, cost-efficient industrial solutions. From planning and commissioning through to service, we operate worldwide in the following areas:

AUTOMATION

CONVEYOR

INTRALOGISTICS

QUALITY

RECYCLING