

MODULAR ALUMINUM SCRAP SORTING SYSTEM



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The Modular Aluminum Scrap Sorting System delivers aluminum recovery in a semi-mobile, deployable configuration for scrap yards, remote sites, transitional operations, and mid-throughput reclaimers that need aluminum sorting without committing to a fixed plant. The system pairs a mobile trommel screen with a mobile eddy current separator and manual sorting stations, letting operators establish a working aluminum sorting flow with minimal civil works.

The Modular Aluminum Scrap Sorting System is engineered for flexibility. Each module is transportable, sets up in hours rather than weeks, and can be relocated as feedstock sources change. Excavator or wheel-loader infeed replaces fixed feeders, the trommel and eddy current modules run on skid or trailer mounts with integrated diesel engine power packs, and manual sorting stations upgrade the recovered fractions to product-grade output. The line handles typical throughput from 10 to 50+ t/h depending on module sizes selected, and adapts to whatever aluminum-bearing feedstock a customer collects.

Compared to a fixed Aluminum Scrap Recycling Line, this modular configuration trades peak automated sensor sorting for deployment speed, capital efficiency, and site flexibility. It suits operators who need working aluminum recovery today rather than a two-year plant build.

APPLICATIONS

Applications

The Modular Aluminum Scrap Sorting System targets aluminum-bearing feedstock at sites where fixed-plant investment is not practical.

- **Small-to-Mid Scrap Yards:** adds aluminum sorting capability to yards that previously baled and shipped mixed scrap
- **Remote Site Operations:** handles aluminum sorting at project sites, decommissioning zones, and rural yards without permanent infrastructure

- **Transitional Aluminum Recyclers:** bridges the gap between manual sorting and a full fixed plant investment
- **Batch Processing Contractors:** supports contract sorting jobs where the equipment moves with the work
- **Municipal Recycling Program Expansion:** adds aluminum recovery to existing MRFs without major civil works
- **Aluminum Concentrate Upgrading:** refines mixed non-ferrous scrap into aluminum, ferrous, and tailing fractions
- **Post-Disaster or Salvage Operations:** supports aluminum recovery from demolition, storm debris, and salvage material where mobility matters

FEATURES

Key Features

The line delivers full aluminum sorting capability across a small footprint, with each module optimized for transportability and rapid deployment.

Excavator or Wheel-Loader Infeed

The system uses excavator or wheel-loader infeed rather than a fixed apron feeder, eliminating the need for a permanent bunker or feed pit. The operator loads mixed feedstock directly into the mobile trommel infeed hopper as needed, matching input rate to downstream throughput.

- **Function:** flexible primary feed from stockpile or bunker
- **Equipment:** customer-owned or rented excavator or wheel loader
- **Advantage:** no fixed feed infrastructure required

Mobile Trommel Screen

The mobile trommel screen delivers first-stage size classification on a skid or trailer-mounted chassis with an integrated diesel engine power pack. Wear-resistant screen panels and a shaft-less drive extend service life on abrasive aluminum shred, and integrated conveyors discharge oversize and undersize fractions to designated collection points. The mobile design lets the trommel relocate with the feedstock source without civil works or grid power hookup.

- **Function:** mobile size classification of mixed aluminum scrap
- **Design:** wear-resistant screen panels, shaft-less drive, integrated infeed and discharge conveyors
- **Mobility:** skid or trailer-mounted chassis with integrated diesel engine (YuChai)
- **Setup time:** hours rather than weeks

Mobile Trommel Screen Specifications:

Model	Power (kW)	Weight (kg)	Engine	Width (mm)	Height (mm)
TT-MTS-1560	39	15,000	YuChai	5,126	3,704
TT-MTS-1860	45	18,000		5,426	4,004
TT-MTS-2060	51	20,000		5,726	4,304

Belt Conveyors (Modular)

Modular belt conveyors connect the trommel discharge to the eddy current separator and manual sorting stations. Conveyors set up on portable stands, adjust height and angle to match the deployment layout, and pack down for relocation.

- **Function:** inter-stage material transport in a modular layout
- **Design:** portable stand-mounted belt conveyors, adjustable length and angle
- **Mobility:** pack down for relocation with the rest of the system

Mobile Eddy Current Separator



The mobile eddy current separator recovers aluminum from the sized feed on a skid or trailer-mounted chassis with an integrated diesel engine power pack. An eccentric high-frequency rotor generates the alternating magnetic field required for eddy current induction, and integrated feed and discharge conveyors deliver aluminum, ferrous byproduct, and tailing to designated collection bins. An integrated magnet upstream of the eddy current stage removes ferrous fragments before eddy current sorting.

- **Function:** mobile aluminum recovery by eddy current separation
- **Rotor type:** eccentric high-speed magnetic rotor
- **Magnet material:** NdFeB (rare earth) with anti-fall protection
- **Integrated ferrous removal:** magnet stage upstream of eddy current
- **Mobility:** skid or trailer-mounted chassis with integrated diesel engine (YuChai)

Mobile Eddy Current Separator Specifications:

Model	Power (kW)	Capacity (t/h)	Weight (kg)	Engine	Length (mm)	Width (mm)	Height (mm)
TT-MECS-12	25	10 to 12	10,000	YuChai	10,200	5,800	3,085
TT-MECS-14	30	15 to 17	12,000				
TT-MECS-17	35	23 to 25	15,000				
TT-MECS-20	40	36 to 38	18,000				
TT-MECS-22	45	54 to 56	20,000				

Manual Sorting Station

Manual sorting stations provide final quality upgrade of the recovered aluminum concentrate and separation of any mixed fractions the automated stages could not resolve. Multi-lane picking conveyors allow parallel sorting of aluminum concentrate, ferrous fraction, and tailing residual, with designated collection bins at each operator position.

- **Function:** manual quality upgrade of recovered aluminum concentrate
- **Configuration:** multi-lane picking conveyors with side-discharge bins
- **Operator positions:** adjustable for one to eight operators per line
- **Product upgrade:** removes heavy attachments, mixed alloys, and coated pieces from concentrate

Discharge and Collection Bins

Portable collection bins receive each output fraction (aluminum concentrate, ferrous byproduct, small material, tailing) at designated discharge points. Bin size and position are configured to match the site layout and downstream handling equipment (skid steer, forklift, or wheel loader).

- **Function:** fraction collection at each discharge point
- **Design:** portable open-top bins, sized for downstream handling equipment
- **Configuration:** multiple bins per output fraction as needed for throughput

Electrical Control System

Each mobile module carries its own electrical control panel with local PLC and interlocks. Modules can operate independently or be linked via a master control panel for full-line coordination. All modules include local emergency stop, overload protection, and diagnostic indication.

- **Controller:** PLC-based local control per module
- **Integration:** optional master panel for full-line coordination
- **Protection:** local emergency stop, overload reverse, safety interlocks

THEORY & METHOD

Theory and Method

Modular aluminum sorting applies the same physical principles as a fixed plant, delivered on transportable modules with excavator or wheel-loader infeed instead of fixed conveyor infrastructure. The core sequence is size classification, magnetic and eddy current separation, and manual quality upgrade of the recovered aluminum.

Size classification comes first. An excavator loads mixed aluminum feedstock into the mobile trommel screen, which splits the material into oversize and undersize fractions and rejects fines to a dedicated collection point. Oversize material is returned for hand-picking or re-loading, while sized material is discharged onto conveyors that feed the mobile eddy current separator.

The mobile eddy current separator recovers aluminum from the non-magnetic stream. An eccentric rotor generates a high-frequency alternating magnetic field, inducing eddy currents in each aluminum particle that produce a repulsive Lorentz force. Aluminum is thrown off the belt trajectory into a dedicated collection bin, while non-conductive material (dirt, plastic, non-metals) falls straight down as tailing, and any ferrous fragments captured earlier by an integrated magnet are diverted to a separate ferrous bin.

Manual sorting stations then upgrade the recovered aluminum concentrate. Operators standing at picking conveyors identify and remove visible contamination (heavy attachments, mixed alloy pieces, coated fragments), improving the concentrate purity before baling or shipping. Multi-lane manual stations allow parallel sorting of different fractions (aluminum concentrate, ferrous fraction, tailing residual) in one work zone.

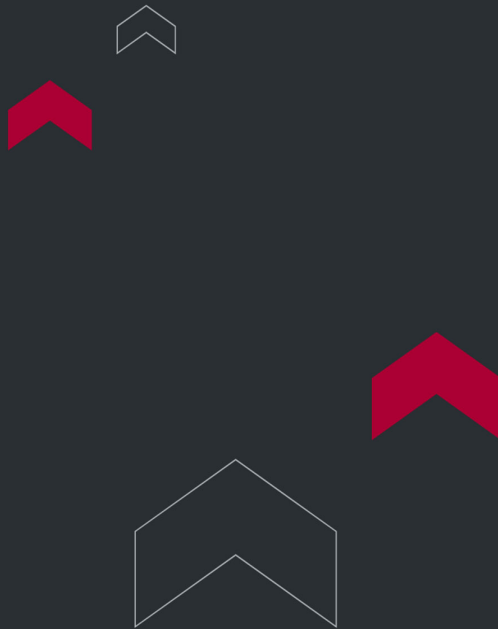
TECHNICAL SPECIFICATIONS

Technical Specifications

The Modular Aluminum Scrap Sorting System is engineered around the customer's site layout, feedstock profile, and throughput target. Each module ships as a self-contained unit for rapid deployment.

Parameter	Specification
Line Focus	Semi-mobile, modular aluminum scrap sorting
Typical Throughput Range	10 to 50+ t/h (module-dependent)
Input Material	Mixed aluminum scrap, extrusion, profile, sheet, mixed non-ferrous feed
Deployment	Skid-mounted or trailer-mounted modules, no civil works required
Setup Time	Hours to days, depending on layout
Feed Method	Excavator or wheel-loader loading, no fixed feeder needed
Size Classification	Mobile trommel screen with integrated conveyors and diesel power pack
Ferrous Recovery Stage	Integrated magnet upstream of eddy current stage
Non-Ferrous Recovery Stage	Mobile eccentric eddy current separator with integrated diesel power pack
Manual Upgrade Stage	Multi-lane picking station with side-discharge bins
Output Fractions	Aluminum concentrate, ferrous byproduct, small material, tailing
Control System	Local PLC per module, optional master panel
Power Supply	On-board diesel engine (YuChai) or 380 V / 50 Hz grid, customer voltage on request
Relocation	Full line relocatable by standard flatbed trailer transport

Each Modular Aluminum Scrap Sorting System is configured to the customer's specific site layout and throughput target. Contact the Torontech application engineering team for a site-specific process flow diagram and quotation.



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