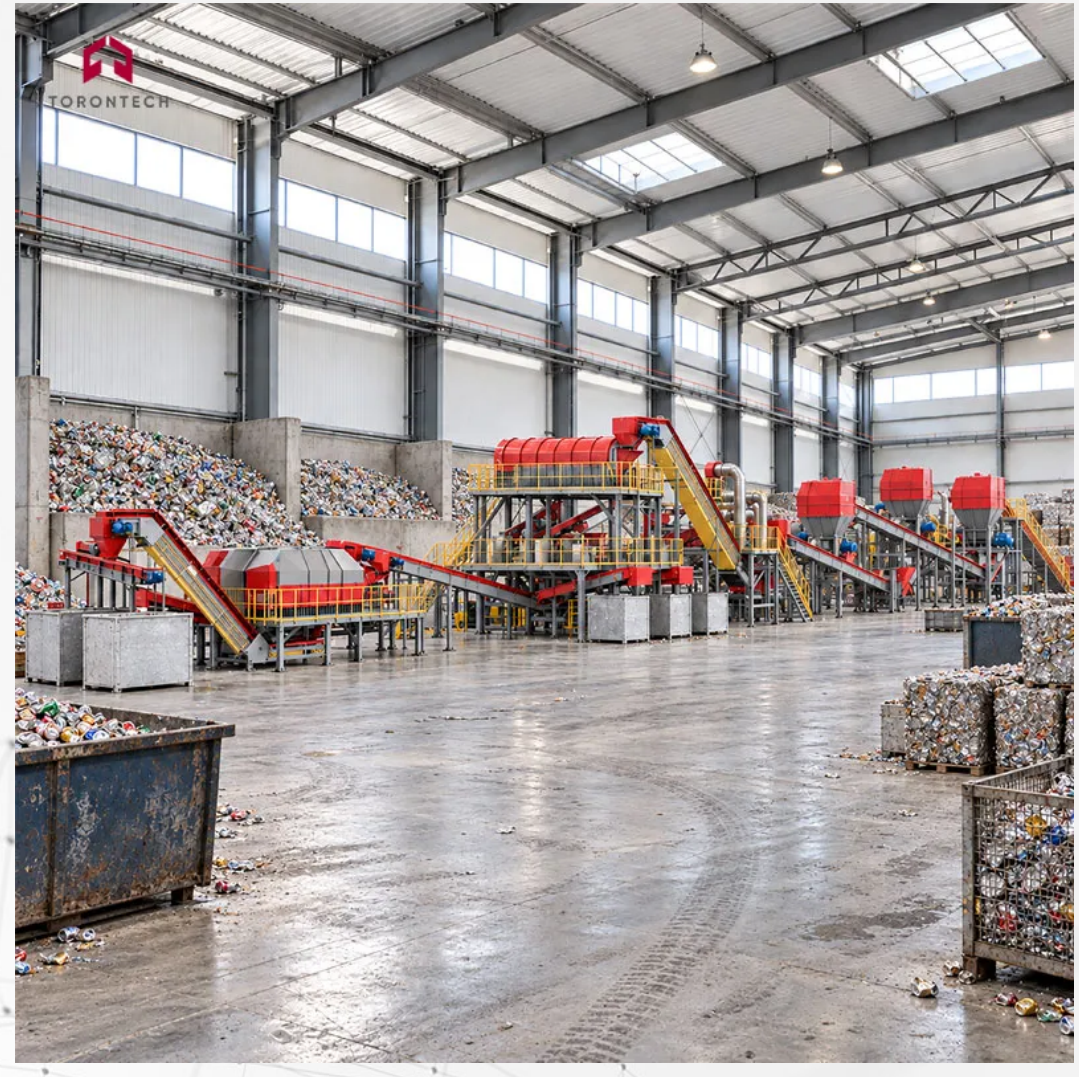
TORONTECH



UBC RECYCLING LINE

UBC Recycling Line

The UBC Recycling Line shreds and sorts used beverage cans (UBC) into clean aluminum, ferrous, and non-metal fractions ready for smelter feedstock or downstream re-melting. The system serves aluminum recyclers, remelters, and closed-loop beverage packaging programs that process baled or loose UBC input at industrial scale.

The UBC Recycling Line pairs dual-stage shredding with layered separation. A twin-shaft shredder opens compacted bales and reduces cans to intermediate size, a single-shaft shredder refines to target flake dimension, and downstream stages (trommel screening, air classification, magnetic separation, eddy current separation, and X-ray transmission sorting) recover each material fraction cleanly. The result is high-purity aluminum flake at yields typically reaching 95 to 98 percent under normal input conditions.

The line supports customer-specific throughput from 2 to 15+ t/h and adapts to varying input formats (baled UBC, loose collection, mixed light-gauge aluminum). Primary shredding can be configured as twin-shaft plus single-shaft (standard UBC config) or hammer mill (higher-abrasion tolerance) depending on the input profile and capacity target.

APPLICATIONS

Applications

The UBC Recycling Line targets used beverage can streams and other light-gauge aluminum feedstocks that require size reduction plus material separation.

- **Used Beverage Can (UBC) Reclamation**: converts baled aluminum can feed into clean flake for closed-loop remelting into rolling stock
- **Aluminum Beverage Packaging Recycling**: processes aluminum bottles, caps, and mixed container aluminum for smelter charge

- **Aluminum Foil and Light-Gauge Recovery**: handles thin-gauge aluminum foil, tray, and packaging scrap
- **Municipal Collection UBC Processing**: sorts co-mingled aluminum recovered from municipal recycling streams
- **Remelter Feedstock Preparation**: delivers sized, cleaned aluminum flake to secondary aluminum smelters and remelt operations
- **Closed-Loop Beverage Programs**: supports "can-to-can" recycling initiatives with contamination-controlled output
- **Scrap Yard Aluminum Upgrading**: refines mixed aluminum scrap into segmented ferrous, non-ferrous, and non-metal fractions

FEATURES

Key Features

The line integrates dual-stage shredding, classification, and multi-stage separation under a single PLC control system, with each module optimized for the specific fraction it handles.

Apron Feeder

The heavy-duty apron feeder receives baled or loose UBC from the tipping floor and meters it onto the inclined infeed conveyor. Its self-scraping chain-plate design handles compacted bales and mixed loose input without bridging or manual intervention.

- **Function**: primary bunker discharge and metering feed
- **Design**: heavy-gauge steel chain plates with self-cleaning scraper
- **Feed handling**: not limited by bale density, particle size, or moisture

High-Angle Belt Conveyor

The high-angle belt conveyor lifts UBC from the feeder to the shredder inlet with corrugated sidewalls and cross cleats that hold material on steep inclines. Its compact footprint fits sites where floor-level space is limited.

- **Function**: steep-incline transfer to shredder inlet
- **Design**: corrugated sidewall belt with cross cleats
- **Advantage**: high throughput in a small footprint, simple maintenance

Twin-Shaft Shredder


TORONTECH
TT-ECS Eccentric Eddy Current Separator

The twin-shaft shredder opens compacted UBC bales and performs primary size reduction. Two counter-rotating shafts carry interchangeable cutter discs that shear the material at low rpm and high torque, so the machine handles baled input, mixed contamination, and dense pack without stalling. Output particle size is set by cutter geometry and shaft speed.

- **Function**: primary bale opening and size reduction
- **Design**: two counter-rotating shafts with interchangeable cutter discs
- **Operating principle**: low-rpm, high-torque shear action
- **Advantage**: handles baled and mixed input without pre-treatment

Twin-Shaft Shredder Specifications:

The single-shaft shredder performs secondary size reduction to the target flake dimensi

Model	Power (kW)	Rotary Diameter (mm)	Center Distance (mm)	Shredder Width (mm)	RPM	Total Weight (t)
TT-TSS-1300	37 + 37	Ø520	400	1300	3 to 15	8
TT-TSS-1500	55 + 55	Ø630	520	1500		17
TT-TSS-1600	75 + 75	Ø510	400	1600		14
TT-TSS-1800	110 + 110	Ø740	610	1800		33
TT-TSS-2200	75 + 75	Ø650	520	2200		30

Single-Shaft Shredder


TORONTECH

A single rotor carries interchangeable knives that shear the material against a stationary comb, and output size is controlled by a bottom screen with user-defined aperture. The machine delivers uniform particle geometry required for downstream eddy current separation and X-ray sorting.

- **Function**: secondary size reduction to target flake size
- **Design**: single-shaft rotor with interchangeable knives and screen-controlled output
- **Advantage**: uniform particle size for sensor-based sorting

Single-Shaft Shredder Specifications:

Model	Power (kW)	Rotary Diameter (mm)	Shredder Width (mm)	RPM	Total Weight (t)
TT-SSS-800	37	Ø400	800	80	4.04
TT-SSS-1200	55	Ø400	1200		5
TT-SSS-1500P	55 + 55	Ø460	1500		11
TT-SSS-2200P	90 + 90	Ø800	2200		19
TT-SSS-3000P	160 + 160	Ø800	3000		25

Hammer Mill Shredder (Alternative Primary Option)



The hammer mill shredder is an alternative to the twin-shaft plus single-shaft configuration for customers with higher throughput requirements or input containing harder inclusions. Hinged hammers on a high-speed rotor impact the material against a breaker plate, producing a densified, cleaned flake in a single pass. Hydraulic feed rollers meter the input against the rotor at controlled speed.

- **Function**: single-pass primary size reduction with densification
- **Design**: hinged hammers on high-speed rotor, hydraulic feed rollers, breaker plate
- **Advantage**: high throughput, tolerant of hard inclusions, densifies output

Hammer Mill Shredder Specifications:

Model	Main Motor / Pressure Roller / Hydraulic (kW)	Rotary Diameter (mm)	RPM	Shredder Width (mm)	Total Weight (t)
TT-HMS-315	315 / 11 + 11 / 15	Ø1300	600	1400	51
TT-HMS-450	450 / 15 + 15 / 15	Ø1300		1600	68
TT-HMS-630	630 / 18.5 + 18.5 / 18.5	Ø1500		1800	98
TT-HMS-900	900 / 18.5 + 18.5 / 18.5	Ø1500		2200	110

Vertical Hammer Mill (Alternative Primary Option)

The vertical hammer mill delivers primary size reduction in a vertical rotor configuration, well suited to aluminum profile scrap and other geometrically consistent input. Material falls into the chamber by gravity, meets the high-speed rotor, and exits through a bottom discharge. The vertical layout gives a compact footprint compared to horizontal hammer mills at similar capacity.

- **Function**: vertical-axis primary size reduction
- **Design**: high-speed vertical rotor with chamber-based impact reduction
- **Advantage**: compact footprint, ideal for aluminum profile and geometric scrap

Vertical Hammer Mill Specifications:

Model	Power (kW)	Rotary Diameter (mm)	RPM	Shredder Chamber Diameter (mm)	Shredder Chamber Height (mm)	Total Weight (t)
TT-VHM-250	110 to 160	Ø1100	520 / 630	1280	1660	18
TT-VHM-450	160 to 250	Ø1500	520 / 630	1600	1800	24

Trommel Screen


TORONTECH
TT-TRS Trommel Screen

The rotary trommel screen classifies the shredded material into size fractions for optimal downstream sorting. Wear-resistant screen panels and a shaft-less drive extend service life on abrasive aluminum shred.

- **Screen material**: wear-resistant alloy panels
- **Drum options**: hexagonal or cylindrical, custom aperture sizes
- **Drive**: polyurethane driving system, low noise, no-shaft design

Trommel Screen Specifications:

Model	Power (kW)	Drum Diameter (mm)	Drum Length (mm)	Capacity (m³/h)	Speed (r/min)	Inclination (%)
TT-TRS-1220	4.0	Ø1200	2000	12	5 to 25	0 to 6
TT-TRS-1240	5.5	Ø1200	4000	18		
TT-TRS-1260	5.5	Ø1200	6000	20		
TT-TRS-1290	7.5	Ø1200	9000	35		
TT-TRS-1560	7.5	Ø1500	6000	35		
TT-TRS-1590	11	Ø1500	9000	50		
TT-TRS-15120	18.5	Ø1500	12000	65		
TT-TRS-1860	11	Ø1800	6000	50		
TT-TRS-1890	18.5	Ø1800	9000	65		
TT-TRS-18120	22	Ø1800	12000	75		
TT-TRS-2060	18.5	Ø2000	6000	65		
TT-TRS-2090	22	Ø2000	9000	75		
TT-TRS-20120	30	Ø2000	12000	85		

Vertical Air Separator


TORONTECH
TT-VAS - Vertical Air Separator

The vertical air separator lifts light contaminants (labels, film, dust) from the sized aluminum stream into a cyclone dust collector. A vibratory feeder distributes material into a Z-hopper, a centrifugal fan draws light particles upward, and heavy aluminum drops by gravity into the discharge.

- **Function**: light-fraction removal and dust extraction
- **Design**: Z-hopper vibratory feed, centrifugal fan, cyclone dust collector

Vertical Air Separator Specifications:

Model	Air Blower	Feed Valve	Light Material Valve	Dust Valve	Capacity (t/h)
TT-VAS-43	20 to 30 HP	2 HP	2 HP	2 HP	4 to 5
TT-VAS-86	40 HP	3 HP	1.5 HP	3 HP	8 to 10

Permanent Overband Magnet (Self-Cleaning)


TORONTECH
TT-POM Permanent Overband Magnet (Self-Cleaning)

The self-cleaning permanent overband magnet removes ferrous fragments (steel closures, bimetal composites) from the aluminum stream continuously. Rare-earth NdFeB magnets deliver strong, stable field intensity without coil power or cooling, and a dedicated self-cleaning belt discharges captured iron to a side chute.

- **Function**: continuous ferrous removal from aluminum stream
- **Magnet type**: high-performance NdFeB (rare earth), no external excitation power required
- **Structure**: double-pole magnetic circuit, waist drum-shaped frame with automatic belt tracking

Permanent Overband Magnet Specifications:

Model	Suitable Belt Width (mm)	Material Thickness (mm)	Suspended Height (mm)	Magnet Intensity	Power (kW)	Belt Speed	Overall Dimensions L×W×H (mm)	Ring Center Distance (mm)	Weight (kg)
TT-POM-5	500	80	150	63 mT	1.5	≤2.5 m/s	1650 × 835 × 940	1100 × 635	580
TT-POM-6	600	125	200				1700 × 835 × 940	1150 × 735	700
TT-POM-6.5	650	150	200				1750 × 985 × 940	1200 × 785	700
TT-POM-8	800	200	250	70 mT	2.2		1900 × 1140 × 960	1350 × 935	820
TT-POM-10	1000	250	300		3.0		2140 × 1350 × 1010	1590 × 1135	1220
TT-POM-12	1200	300	350		4.0		2340 × 1550 × 1060	1790 × 1335	1420
TT-POM-14	1400	350	400		5.5		2540 × 1750 × 1060	1990 × 1535	1730

Model	Suitable Belt Width (mm)	Material Thickness (mm)	Suspended Height (mm)	Magnet Intensity	Power (kW)	Belt Speed	Overall Dimensions L×W×H (mm)	Ring Center Distance (mm)	Weight (kg)
TT-POM-16	1600	400	450	7.5	3040 × 1550 × 860	2190 × 1335	2140		

Eccentric Eddy Current Separator

The eccentric eddy current separator recovers aluminum from the non-magnetic stream. An eccentric rotor design places the magnetic pole close to the belt surface, giving a wider throw angle for small aluminum flakes than a concentric rotor design. A vibrating feeder plus adjustable baffle allows fine-tuning to the specific flake profile. For UBC applications, the high-frequency (H) rotor variant handles the finer aluminum fraction while the standard rotor handles coarse material.

- **Rotor type**: eccentric high-speed magnetic rotor
- **Particle size range**: ≥1 mm²
- **Magnet material**: NdFeB with anti-fall spray-plastic protection
- **Recovery target**: aluminum flakes and other non-ferrous metals

Eccentric Eddy Current Separator Specifications:

Model	Feed Width (mm)	Feed Length (mm)	Particle Size	Capacity (m³/h)	Power (kW)	Weight (kg)	Length (mm)	Width (mm)	Height (mm)
TT-ECS-5	300	1500	≥1 mm²	6	5.9	730	4600	1123	1200
TT-ECS-6	400			10	5.9	895		1223	
TT-ECS-8	600			20	5.9	1225		1623	
TT-ECS-10	800			25	6.3	1555		1823	

Model	Feed Width (mm)	Feed Length (mm)	Particle Size	Capacity (m³/h)	Power (kW)	Weight (kg)	Length (mm)	Width (mm)	Height (mm)
TT-ECS-12	1000	30	7.0	1875	2023				
TT-ECS-14	1200	35	8.8	2275	2223				
TT-ECS-16	1400	40	10	2850	2423				
TT-ECS-20	1800	50	10.7	3650	5000	2823			
TT-ECS-22	2000	55	13	4500		3023			

X-Ray Transmission Sorter


TORONTECH
TT-XRT - X-Ray Transmission Sorter

The X-Ray Transmission sorter provides final quality upgrade of the aluminum concentrate by rejecting any residual heavy metal contamination (copper wire from can tabs, lead-bearing fragments, bimetal composite pieces). Material passes on a conveyor belt between an X-ray emitter above and a set of LDA dual-energy receivers below, and a self-learning classifier reads the atomic-density signal and triggers a compressed-air jet valve at the belt head pulley to eject targeted particles.

- **Detection method**: dual-energy X-ray transmission with LDA receivers
- **Classifier**: self-learning system that accumulates material characteristic samples
- **Typical UBC application**: heavy metal contamination removal from aluminum concentrate
- **Ejection**: compressed-air jet valve array

X-Ray Transmission Sorter Specifications:

Model	Belt Width (mm)	Raw Material Size (mm)	Capacity (t/h)	Power (kW)	Weight (t)	Machine Size L×W×H (mm)
TT-XRT-1200	1200	10 to 100	4 to 6	6.6	3	6000 × 1490 × 1780
TT-XRT-1800	1800		6 to 8	6.6	4	6000 × 2090 × 1780
TT-XRT-2400	2400		8 to 10	6.6	5	6000 × 2690 × 1780

Chain Apron Conveyor and Belt Conveyors

Heavy-duty chain apron conveyors handle high-abrasion transfers (post-shredder discharge, ferrous byproduct), while belt conveyors handle the lighter-duty inter-stage transfers between sensor sorting modules. All conveyors are integrated into the central PLC control system for coordinated line operation.

- **Chain apron function**: high-abrasion transfer
- **Belt conveyor function**: light-duty inter-stage transfer
- **Integration**: full PLC coordination and safety interlocks

Electrical Control System

The line runs under a single PLC control system with automatic overload reverse control, interlock logic, and an operator HMI. All motors, sensors, and pneumatic actuators are wired to the central cabinet for coordinated operation and remote diagnostics.

- **Controller**: PLC-based programmable control
- **Protection**: automatic overload reverse, safety interlocks across the full line
- **Interface**: HMI touchscreen with process-status visualization

THEORY & METHOD

Theory and Method

Used beverage cans arrive in compacted bales or loose form and must be opened, sized, and separated before entering a remelt furnace. Contamination in the aluminum output directly reduces the value of the metal and damages the melting process, so the line applies a sequence of mechanical, magnetic, air-based, and sensor-based separations, each targeting one property of the input mix.

Size reduction comes first. A twin-shaft shredder tears open bales at low rpm and high torque, exploiting the shear action of two counter-rotating shafts to handle the packed input without stalling. A single-shaft shredder then reduces the intermediate output to the target flake size against a stationary comb screen, giving controlled particle geometry for downstream separators. For higher throughput or when input contains harder inclusions, a hammer mill is used instead: hinged hammers on a high-speed rotor impact the material against a breaker plate, producing a densified, cleaned flake.

The sized material then passes through classification and separation stages. A trommel screen splits the material into size fractions for optimal downstream sorting. A vertical air separator lifts light contaminants (film, labels, dust) into a cyclone dust collector. A permanent overband magnet removes ferrous fragments (steel closures, bimetal composite pieces). Eddy current separation recovers the aluminum: a high-frequency eccentric rotor generates a rapidly alternating magnetic field, inducing eddy currents in each aluminum particle that produce a repulsive Lorentz force, throwing aluminum off the belt

trajectory while non-conductive material falls straight down. A second eddy current stage catches undersize aluminum missed by the primary. Finally, an X-ray transmission sorter distinguishes any remaining metal by atomic density, cleaning heavy metal (copper wire from tabs, lead-bearing contamination) out of the aluminum concentrate.

TECHNICAL SPECIFICATIONS

Technical Specifications

The UBC Recycling Line is engineered around the customer's input format (baled or loose UBC), throughput target, and output purity requirement. Primary shredding can be configured as twin-shaft plus single-shaft (standard UBC) or hammer mill (higher throughput or harder input).

Parameter	Specification
Line Focus	Used beverage can shredding, sorting, and aluminum flake recovery
Typical Throughput Range	2 to 15+ t/h (customer-specific)
Input Material	Baled or loose UBC, aluminum can scrap, light-gauge aluminum
Aluminum Recovery Yield	95 to 98% under normal input conditions
Primary Shredding Options	Twin-shaft + single-shaft (standard) or hammer mill / vertical hammer mill
Ferrous Recovery Stage	Permanent overband magnet
Non-Ferrous Recovery Stages	Eccentric eddy current separator (with high-frequency variant for fine fraction)
Sensor-Based Sorting	X-ray transmission (dual-energy) for final quality upgrade
Size Classification	Rotary trommel screen
Light-Fraction Removal	Vertical air separator with cyclone dust collector

Parameter	Specification
Control System	PLC with HMI touchscreen, full-line interlocks
Installation Options	Skid-mounted modules or civil-work integrated
Power Supply	380 V / 50 Hz (customer voltage available on request)

Each ToronUBC™ line is engineered to the customer's specific input profile and output purity targets. Contact the Torontech application engineering team for a site-specific process flow diagram and quotation.

TORONTECH.com

TORONTECH

Torontech Inc.
251 Consumers Road, Suite 1200
Toronto, Ontario, M2J 4R3, Canada

Phone: +1 416 368 2721 | Fax: +1 416 981 7652
Email: info@torontech.com

Torontech, LLC
601 Brickell Key Drive, Suite 700
Miami, FL 33131, USA

Toll-Free: 1-866-383-7919
Email: sales@torontech.com

Torontech ME FZE
Meydan Grandstand, 6th Floor,
Meydan Road, Nad Al Sheba,
Dubai-261440, UAE

Phone: +971 488 19252
Email: me@torontech.com

USA | Canada | EU | UAE | GCC | KSA | India | Africa | Latin America | Asia