

# Metal Recovery Equipment & Systems





# World Leader in Metal Separation Technology



## *A History of Innovation*

Eriez has a rich history of process innovation and product development throughout the recycling, mining and process industries. From the first plate magnet built in the 1940s to remove dangerous tramp metal during gain handling, metal separation has been Eriez' corporate strength. One of the many innovations that followed was the company's development of the first patented Eddy Current Separator technology for aluminum recycling.

## *End-to-End Metal Recovery*

Today, Eriez employs a range of separation technologies to efficiently recover valuable ferrous and nonferrous throughout the scrap metals process. Ballistic, gravity, magnetic and sensory equipment are specifically design to optimize the recovery of different metals and mixed metal fractions to maximize their value.

## *ReCOVERY™ Magazine*

Filled with industry editorial, process innovations, material analysis and more, Eriez' 24-page ReCOVERY Magazine provides processors with the latest technologies design to improve the "recovery grade curve". Request to receive this publication at [www.Eriez.com](http://www.Eriez.com) or download the Recovery App in the iTunes store.





World Leader



# CleanStream<sup>®</sup> - Maximizing Ferrous Recovery

## CleanStream ferrous processing

- PokerSort<sup>®</sup>
- P-Rex<sup>®</sup> Scrap Drum
- Shred1<sup>®</sup> Ballistic Separator

**PREMIUM**  
Fraction as low as  
**0.17% Copper**



Eriez' CleanStream<sup>®</sup> ferrous process sets a new standard in scrap metal separation. The process begins with PokerSort<sup>®</sup> to remove troublesome poker, uses super strong P-Rex<sup>®</sup> permanent rare earth drum magnets to maximize ferrous extraction while loosening and removing waste, and then automatically concentrates the ferrous product into a low-copper premium shred through the new Shred1<sup>®</sup> ballistic separator.

## *The Value of a Premium Ferrous Product*

Clearly, worldwide demand for steel is on the rise. Scrap processors able to supply steel mills with a very high-grade ferrous product are positioned well for the future. However with decline in availability of pure, high-quality industrial scrap, processors are shredding more "consumer waste" than ever before. Post-consumer waste, items like appliances, contain lots of motors, condensers, wire harnesses as well as cast aluminum pieces all which have steel housing, shafts or cores. This presents a problem for most yards using current processing technology.

The CleanStream ferrous process changes this dynamic and allows processors to differentiate themselves with a premium ferrous shred and have the ability to demand a higher value per ton.



*Industry's strongest  
scrap drum magnets*



# CleanStream



# P-Rex®

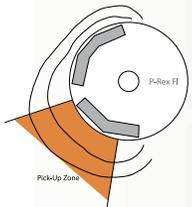
Permanent  
Rare Earth Xtreme®

# Scrap Drum Magnets

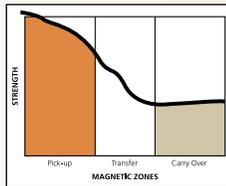
## Scrap Drum Comparison

### P-Rex Magnetic Profile

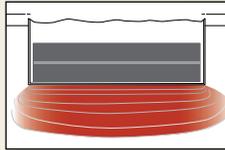
#### Pick-Up Zone



#### Strength Comparison



#### Edge-to-Edge Consistent Strength



Recent innovations in scrap drum magnets have allowed processors to extract more ferrous from the original shred. This is critical as 90% of processor's revenue comes from the ferrous fraction.

*P-Rex®...*

### *The Evolution of the Drum Magnet*

P-Rex's powerful permanent magnetic circuit is up to 40% stronger than typical electro and is capable of moving large spherical objects at twice the distance. These heavy spheres, referred to as meatballs and knuckles, often contain valuable nonferrous metals and represent the most difficult type of object to capture magnetically.

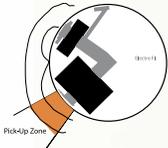
While P-Rex maintains a constant strength profile, traditional electros are subject to significant strength loss due to heat gain... typically around 30% within three hours of start up!

#### **P-Rex benefits:**

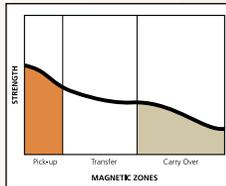
- 40% Stronger during operation
- Significantly wider pick-up zone
- Triple agitation cleaning
- No heat induced strength loss
- No power required

### Electro - Hot Magnetic Profile

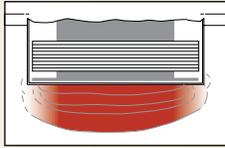
#### Pick-Up Zone



#### Strength Comparison



#### Weak at the Edges





*Wide Pick-Up Zone*



*P-Rex Scrap Drum with Traction Plate Drum Wrap provides magnetic gripping power from edge to edge.*

# Drum Magnets



# SHRED1® - Ballistic Separator...

## *Automatically Produces A Premium Low-Copper Shred*

Shred1® uses ballistics to efficiently separate iron-rich ferrous from much of the mixed metals and waste material in the post drum magnet flow. The separator delivers two distinct fractions... a premium low-copper ferrous product and a traditional #2 shred.

*Ballistics is the science of mechanics that deals with the flight, behavior, and effects of projectiles... the science or art of designing and accelerating projectiles so as to achieve a desired performance.*

The Shred1 ballistic separator not only concentrates 75% of the post drum magnet flow into a low-copper premium shred, but it also eliminates the need for scavenger magnets, and reduces hand picking required.

New

## POKER SORT®

### *Removes long, troublesome pokers from shredded material*

Eriez' new PokerSort extracts long, troublesome pokers like automotive leaf springs, tie rods, steering and axle components and other generally uncooperative long shapes directly from the shred before the drum magnet. The belt-driven PokerSorts are 18-inches in diameter and available in a range of sizes from 36- to 96-inches wide. In most cases, PokerSort can be retrofitted to meet existing ferrous processing set-ups.



**Shred1's Two Fractions:**

**Fraction 1**

- Produces a low-copper shred
- 70 to 80% of flow
- Contains less than 0.2% copper

**Fraction 2**

- Produces a #2 Shred
- 10 to 25% of flow
- Copper/steel and aluminum/steel

**SHRED1**

**Ballistic Separator**



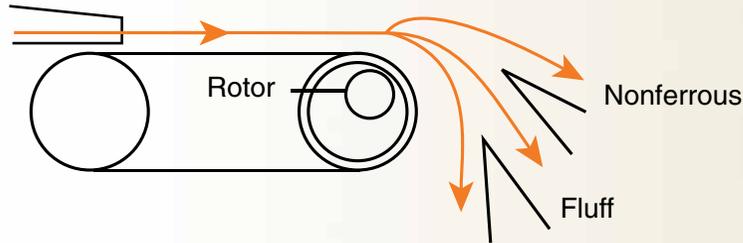
*PokerSort® extracts troublesome "pokers" from the shred*

**Shred1® PokerSort®**

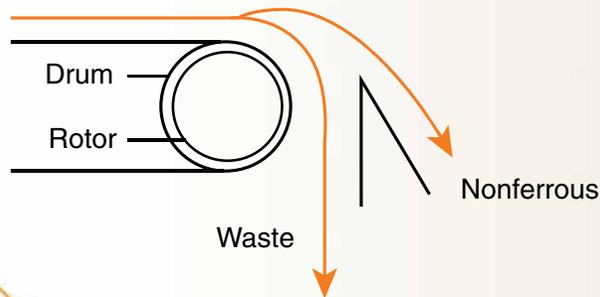


# Eddy Current - Heavy Duty Nonferrous Separators

**Eccentric Rotor**



**Concentric Rotor**



Eriez designed and patented the original eddy current separator in the 1960s to separate nonferrous metals from a wide range of processes. Operationally, an internal permanent magnetic rotor with alternating polarity turns at much higher RPM than the non-magnetic external shell. Through the induction of eddy currents, the alternating magnetic field selectively “repels” and separates the nonferrous metals traveling across the slower belt.

## *RevX-E® Eccentric*

The RevX-E® Eddy Current Separator is magnetically designed to provide enhanced separation of nonferrous metals. This equipment enables maximum separation. Independent tests show Eriez' RevX-E Eddy Current Separators throw aluminum “fines” nearly 20% farther than other top selling brands. It is ideal for recovering nonferrous metals from automobile shredder residue and incineration bottom ash. It is also suited for purifying glass cullet, plastic and foundry sand.

### **RevX-E Eccentric Eddy advantages:**

- Rare Earth rotor produces a powerful focused field
- Rotor position is adjustable for optimum separation
- Reduces long-term wear from ferrous buildup
- Compact design requires less space
- Access panels conveniently located for easy service
- Machines available in widths up to 2 m

### **Three Sizes in Stock**

Now stocking three sizes: 1, 1.2 and 1.5 meter machines with optional features including feeder, feeder support framework, separation shroud and controls.



*Compact powerful  
Rare Earth ECS for  
nonferrous recovery*



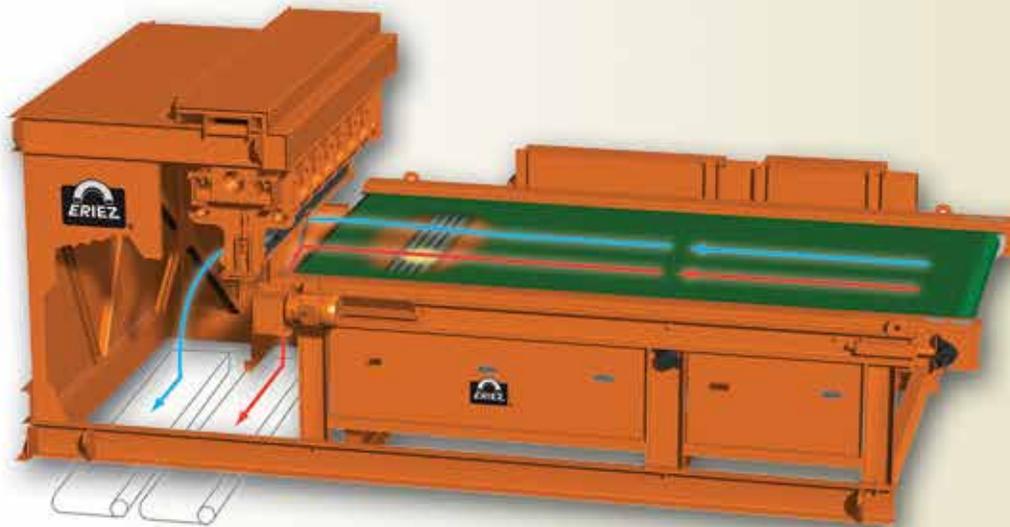
*Eccentric rotor  
configuration*

*Xtreme Eddy Current Separators*

# Eddy Currents



# ProSortII - The Airless Metal Recovery System



## Legend

- Waste
- Coarse Metals (NF and SS)

Eriez' ProSort systems improve metal recovery from waste streams while operating at a fraction of the cost of air power metal sorters. Ideal for scrap processors, the new airless ProSortII doubles the number of metal sensors found on the original ProSort machine and positions them on one-inch centers. These high resolution sensors are aligned with a new inverted paddle mechanism to improve recovery of valuable metals. This new arrangement improves large and small metallic recovery while producing a "cleaner" fraction.

## ProSort II Advantages:

- NO AIR compressor plant required
- Low operating and maintenance cost
- Sensor activated paddles deflect detected metals
- Modular design up to 90" wide
- Reduced dust generation
- Excellent cold weather operation

## ProSort II Improvements:

- Double the sensors on one-inch centers
- New high resolution sensors
- Inverted paddles improve separation
- Better recovery of heavies (meatballs) and lights (wire harnesses)



*Powerful paddles deflect metals into sorting stations*



*"Clean metals" recovered*



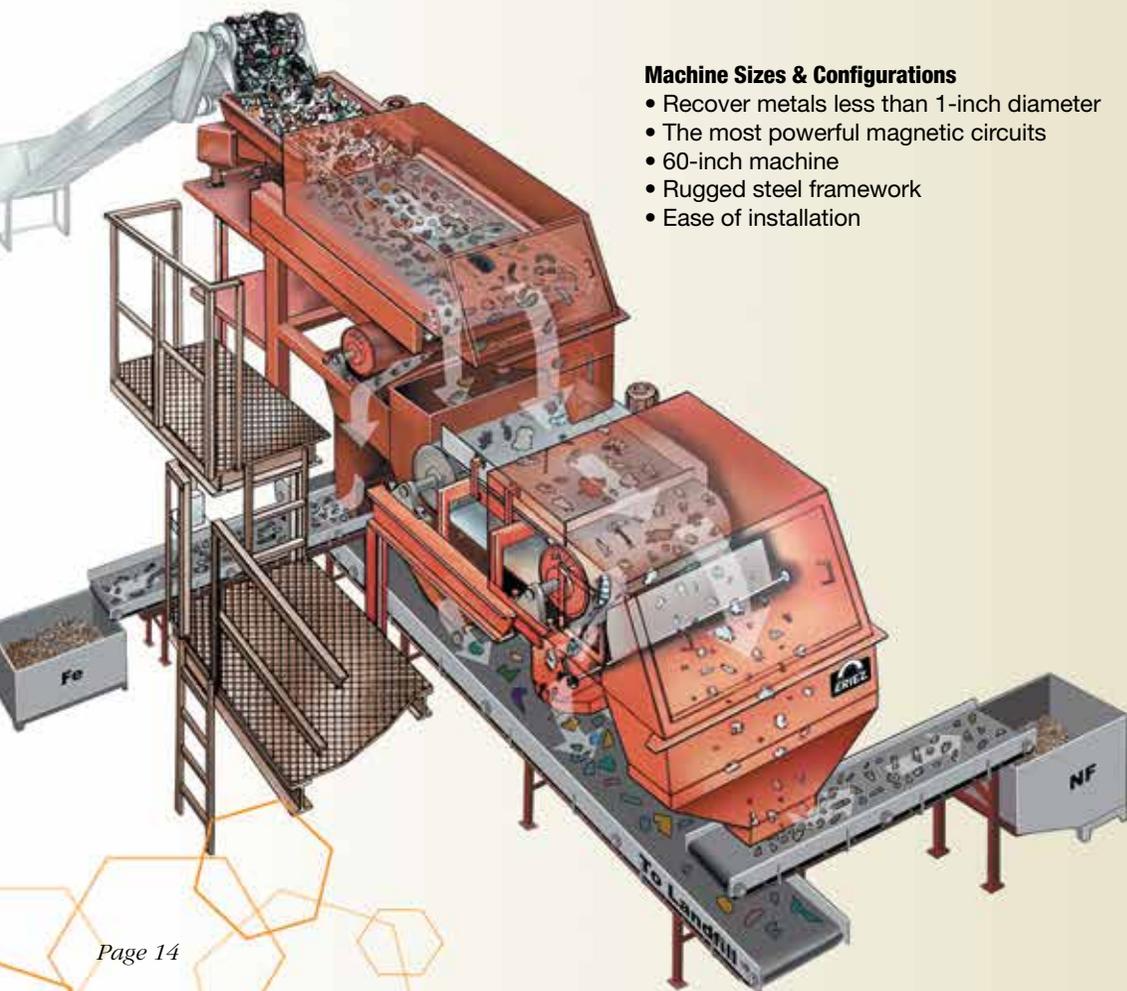
# ProSort II



# FinesSort® - Fines Metal Recovery System

## Machine Sizes & Configurations

- Recover metals less than 1-inch diameter
- The most powerful magnetic circuits
- 60-inch machine
- Rugged steel framework
- Ease of installation



Typically, scrap yard operators have been concerned with reclaiming the larger sized nonferrous metals. Smaller sized materials pass through initial screening, are discarded and sent to the landfill. This smaller material or “fines” might seem insignificant, but reclaiming these valuable metals can be worth tens of thousands of dollars annually.

## Multi-Stage Separation

FinesSort® uses a series of magnets to separate the material into three products... clean ferrous, small nonferrous and waste. Stage one uses a powerful Rare Earth pulley in combination with a magnetic drum to separate the ferrous materials from residual waste. The clean ferrous is dropped onto a cross conveyor and light non-metal material is directed to a waste conveyor. In the second stage, a specially designed Eddy Current propels small nonferrous metals missed by the main Eddy onto a separate conveyor.

**Eriez' sorters have made significant improvements in scrap recovery rates. Below is a sample of one yard's findings...**

**Recovery increase of:**

- |      |                          |
|------|--------------------------|
| +17% | Zorba Product            |
| +47% | Copper Pickings and Wire |
| +76% | Stainless Steel          |

**Nonferrous Fines <1-inch**

**+1,000 lbs/hr recovery rate**

**Fluff reduction:**

- |      |                       |
|------|-----------------------|
| -10% | Fluff to the landfill |
|------|-----------------------|



*Small nonferrous metals are propelled over the splitter*



*FinesSort Jr.  
Economical recovery  
of nonferrous >1 inch*

# FinesSort



# DensitySort® - Upgrades Zorba to Twitch and Zebra

Eriez' economical DensitySort® quickly sorts nonferrous "fines" into fractions of Twitch and Zebra greatly improving their value. Typically, nonferrous fines contains 8 to 12% red metals. By further separating these metals, processors can increase their fines' value by more than 20%.

## Riffles

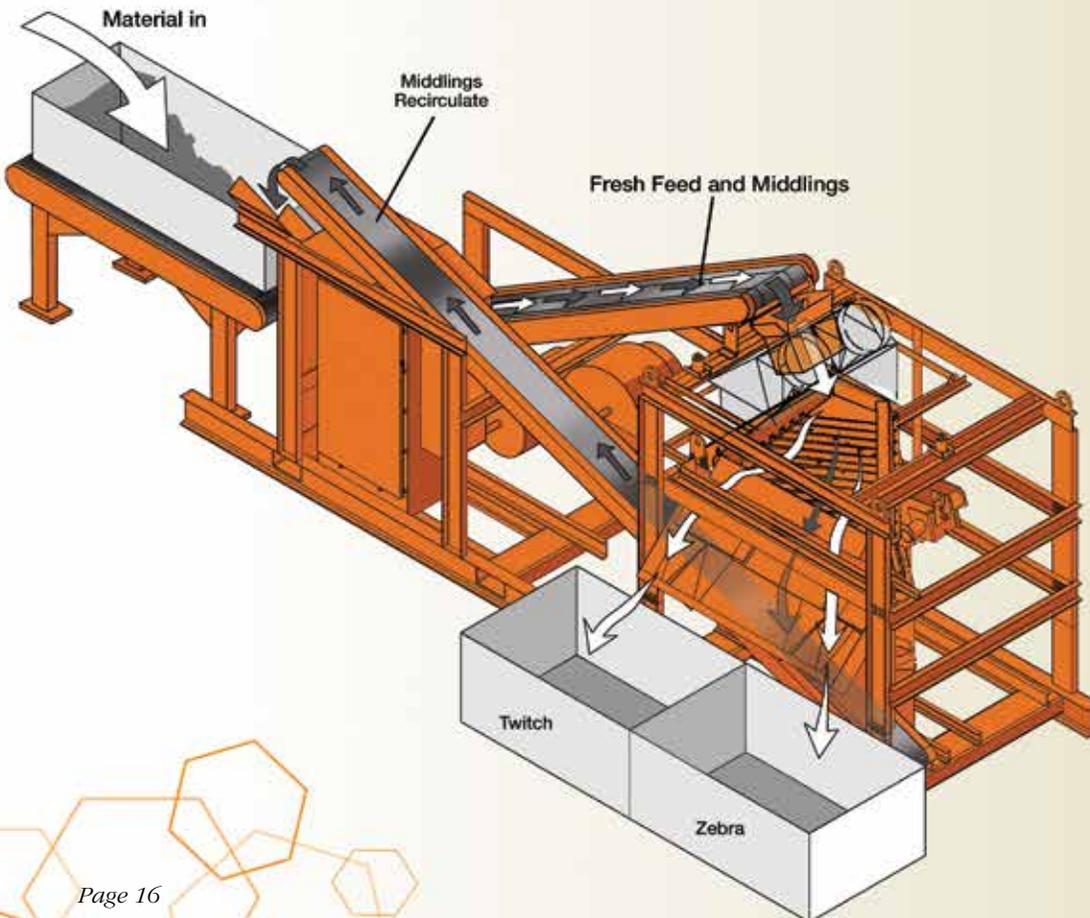
The angled riffles are arranged across the surface helping direct the heavy material toward high end to form a heavy material band. The heavy metals such as copper, lead and zinc scraps penetrate the material bed and settle down to decking. Once the heavies touch the decking, they are then guided by riffles to be moved to the high end by vibration and discharged into heavy bin.

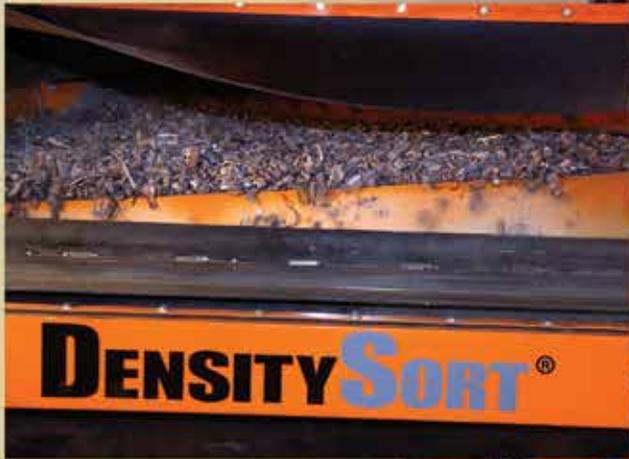
## Vibrators

Twin heavy-duty, elliptical-action vibrators along with air jets effectively loosen the bed and allow heavies to move down to deck while light material such as aluminum scrap floating on the top and flowing down to the lower end. Eriez' ERV models are constructed for dusty environments.

### DensitySort Advantages:

- Separates nonferrous fines
- Greatly improves fines value
- High throughput 6 to 8 tph/machine
- Produces "Twitch"
- Recovers nearly 65% red metal on the first pass
- No sands, water or filtration needed
- Processes < 1" and 1x2-inch fractions without adjustments
- Payback in as little as 6 months
- Product is washed by air and is ready for further hand picking





*Suspended air table*



*Media-free air table*

# DensitySort



# Other Separation Equipment



*Armor Clad Belt Suspended Electromagnet*



*AIP Magnetic Head Pulley*

## *Suspended Belt Magnet Separators – Electro and Permanent*

Automatically remove ferrous from nonferrous materials conveyed in deep burdens on almost any type of conveyor or chute. Ideal for separation applications on wet or dry, fine or coarse materials.

## *Magnetic Pulleys*

Powerful Axial Interpole circuit magnetic pulleys are used for effective separating heavy and fine iron from conveyor transported materials.

## *Electrostatic Separator*

Electrostatic separation relies on the difference in surface conductivity of the materials to be separated. Conductive and nonconductive particles such as chopped wire and computer scrap can be efficiently separated.

# Feeders And Conveyors

## *Vibratory Feeders*

Eriez offers a complete line of vibratory equipment to convey, screen, and feed materials. Models with capacities up to 850 tons per hour are designed for smooth transfer and controlled feeding.

## *Mechanical Feeders*

Low horsepower, high-capacity mechanical feeders handle bulk materials in volumes up to 2,250 tph. Eriez' HVF Mechanical Feeders are available in nine models.

## *Electric Rotary Vibrators*

This broad range of rugged mechanical vibrators will handle practically all application needs. They provide an effective driving force for vibratory screeners, feeders and conveyors.

## *Mechanical Conveyors*

Highly efficient, single-mass mechanical conveyors are designed to move light loads of bulk material reliably and economically.



# Vibratory



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