# MSS

**Optical Sorting Technology**

MSS FiberMAX™

*Simply Smarter Sorting*

# MSS

## Over 42 Years of Experience in Sensor-Based Sorting

MSS sensor-based sorting systems are statistically proven to provide more efficient separation than any other optical sorters on the market. No matter how complex your requirements, MSS systems are the answer.

## Cutting -Edge Technology

MSS develops its sensor hardware and software in-house and from the ground up, with total control over our products and technology. The scan rate of our NIR optical sorters is up to double the rate of our competitors, and we go much deeper into the NIR spectrum than other suppliers.

## Ultimate Sorting Efficiency

MSS optical separators feature automated internal calibration, eliminating the need for manually re-calibrating. This reduces maintenance time and increases worker safety.

## Our Commitment to Service

MSS provides continuous after-sale service as well as phone and remote access support for the life of our products. We provide unrestricted access to all levels of the software for our units, and our software licenses never expire!

## A Division of the CP Group

MSS Inc. is a division of the CP Group, which provides complete recycling solutions from MRF engineering to installation by combining the experience of MSS, CP, Krause, and Advanced MRF.

## Seeing Is Believing!

Contact us for a demonstration:
615-781-2669
info@mssoptical.com

## Sorting Applications

### Plastics

Separation of plastics by any color and resin type (clear vs. light-blue PET, PE, PVC, HDPE, PP, PS, PLA, PET-G, etc.).

### Paper

Sorting of different paper grades (ONP, mixed paper, OCC, white ledger, etc.) as well as removing non-fiber contaminants.
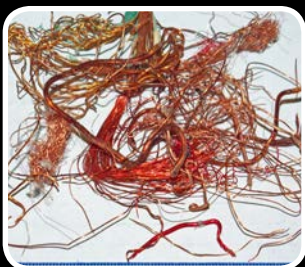
### Metals

Recovering ferrous, non-ferrous and stainless from ASR as well as further separation of Zorba and Zurik fractions.

### E-scrap

Sorting of shredded electronic scrap (WEEE) by material type (ABS, HIPS, PC, PMMA, PC-ABS), color and shape.

### RDF

Separation of contaminants such as PVC or metals from mixed waste streams and generation of BTU-specific RDF fuels.

### C&D, Biomass

Sorting of wood, plastics, fiber, drywall and metals from pre-processed C&D and biomass streams.

### MSW, C&I

Extraction of specific plastic, paper and metal commodities from heavily contaminated feedstocks.
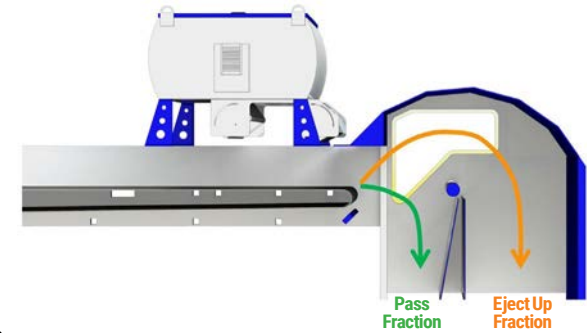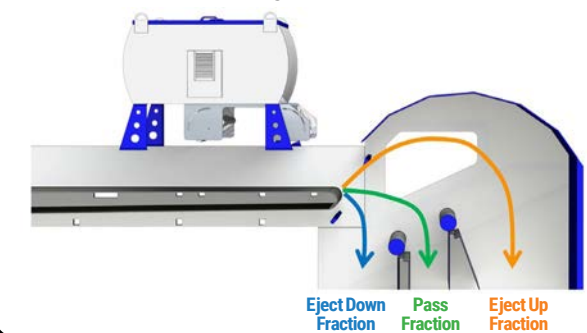
### Glass

Removing non-glass contaminants and sorting glass cullet by color (flint, green, amber, blue).

## Sensor Configurations

### Over-the-Belt Single-Eject
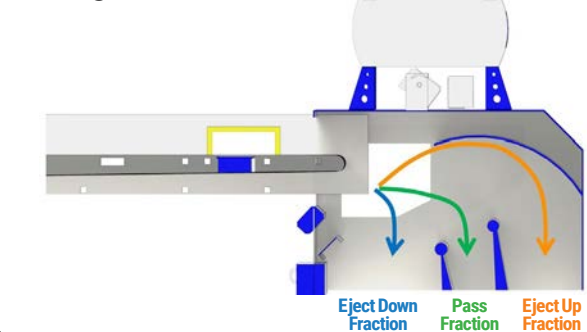
Pass Fraction    Eject Up Fraction

### Over-the-Belt Dual-Eject

Eject Down Fraction    Pass Fraction    Eject Up Fraction

### In Flight Detection

Eject Down Fraction    Pass Fraction    Eject Up Fraction

# CIRRUS® FiberMAX™

### Next-Generation Optical Fiber Sorting Technology

Based on the popular CIRRUS® sensor platform, FiberMax™ provides operation flexibility and top of the line sensing capabilities.

**MaxSelect™** utilizes patented sequential scanning technology for the highest-definition image possible. High number of NIR and color wavelengths make it possible to change sort setups by only software programming, no hardware changes required.

**ClearLight™** technology provides the best signal-to-noise ratio of any optical sorter in the recycling industry. MSS doesn't use gratings or light beam splitters, so detectors receive the maximum amount of reflected light possible, allowing for the most accurate detection of highly transparent items such as lightweight single-serve PET bottles.

### Your Shield Against the National Sword

The ultimate optical fiber sorting solution for MRFs, FiberMax™ reduces head-count on the Fiber QC line while greatly improving fiber purity for best marketability, reducing exposure to market risks such as "Green Fence" or "National Sword."

### The Material Handling Experts

One FiberMax™ does the job of 20 manual QC sorters, averaging 600-800 picks per minute.

Maximizing material recovery relies on proper material handling. MSS uses high-velocity belt speeds of 1,000 feet/minute (5 meters per second). This enables proper material distribution that results in minimal collateral damage, giving FiberMax™ a competitive advantage over other optical sorters.

## FiberMax™ Sort Efficiency

**97%**
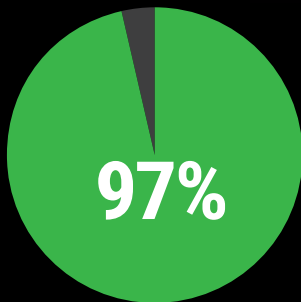
*In an independent 2017 study, FiberMax™ achieved a 96.6% sorting efficiency on flexible plastics packaging (FPP) such as film, bags, pouches, etc. from mixed paper in a commercial single-stream MRF. Over 23,000 pieces of FPP were artificially added to the input material in order to create a "spiked" sample that generated more statistically relevant data.*

## Features

- Near-Infrared (NIR) and color sensors included
- Single-eject or dual-eject setup
- Color touchscreen with remote Ethernet access
- Language selection
- Change recipes by the touch of a button
- Continuous automated internal calibration
- Software license never expires
- 1,000 FPM (5m/sec) belt speeds

## Applications

- Sort contaminants + OCC from ONP and SRP
- Positively Sort ONP and SRP
- Positively Sort SOP and SWL

## Upgrades

- All-metal detector
- Split configuration
- Statistics/QC reports

## Specifications

- Machine width . . . . . . . . . 1600–2800mm, 64"–112"
- Capacity paper* . . . . . . . . 2.0–12.0 ton/hr
- Efficiency* . . . . . . . . . . . . Up to 98%
- Electricity . . . . . . . . . . . . . 8–12kW
- Compressed air . . . . . . . . . 100 psi / 7 bar

* Actual throughput and performance depends on a number of
  factors including, but not limited to, input material composition,
  particle size, bulk density and % of targeted materials.

*www.mssoptical.com/fibermax*

# CIRRUS®
# PlasticMAX™

## Best In-Class Optical Sorter

All CIRRUS® PlasticMax™ sorters combine high-resolution NIR, color, and metal sensors to accurately sort a wide variety of materials, using advanced algorithms.

Our proprietary MaxSelect™ sequential scanning technology provides the best combination of scan rate, number of wavelengths and NIR wavelength range (up to 2,500nm).

The integrated ClearLight™ technology provides the best signal-to-noise ratio of any optical sorter in the recycling industry because MSS doesn't use gratings or light beam splitters.

## PlasticMax™

For PlasticMax™ MRF applications, the always built-in NIR and color sensors allow changing sort recipes by the touch of a button, no hardware changes required.

Challenging materials such as short fills are sorted more effectively due to full object analysis.

## PurePlasticMax™

For plastic recyclers, PurePlasticMax™ sorts the even most challenging plastics, such as full-body sleeved and PET-G labeled bottles. In-flight detection over an illuminated reference provides higher signal levels for transparent items such as PET bottles.

## FilmMax™

MSS' proprietary material handling and air-assist system allows FilmMax™ to remove contaminants and off-color materials from pre-shredded plastic film and flexible packaging. In-flight detection over an illuminated reference allows the removal of black items as well.

## eMax™

For electronic scrap/WEEE applications, eMax™ provides an even higher NIR resolution to handle the smaller particle sizes. In-flight detection over an illuminated reference allows the sorting of ABS, HIPS, PC, PC-ABS from pre-shredded e-scrap or PMMA from flat panels.

## FlakeMax™

FlakeMax™ provides the highest NIR/VIS pixel resolution of the CIRRUS® family. In-flight detection over an illuminated reference allows it to separate contaminants and off-color materials from granulated plastic flake, including black items. FlakeMax™ is best suited for PET and PE/PP recyclers.
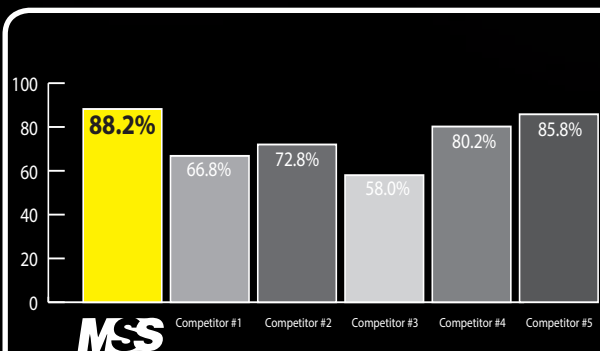


*In an independent 2016 study, PurePlasticMax™ topped five other competitors with the highest sorting performance. The study focused on the identification of PET bottles of various colors (substrate) behind partially or fully sleeved labels of various colors.*

Chart values:
- MSS: 88.2%
- Competitor #1: 66.8%
- Competitor #2: 72.8%
- Competitor #3: 58.0%
- Competitor #4: 80.2%
- Competitor #5: 85.8%

*Sleeved PET Bottles*

*HDPE*

*Plexiglass*

## Features

- Near-Infrared (NIR) and color sensors included
- Detection options:
  - Over-the-belt
  - In flight with reflective reference
  - In flight over illuminated reference
- Single-eject or dual-eject setup
- Color touchscreen with remote Ethernet access
- Language selection
- Change recipes by the touch of a button
- Continuous automated internal calibration
- Software license never expires

## Applications

- Plastic Bottles
- Plastic Flake
- Plastic Film
- 3D Fiber + Cartons
- Electronic Scrap
- MSW / RDF / C&I / C&D

## Upgrades

- All-metal detector
- Split configuration
- Statistics/QC reports

## Machine Specifications

- Machine width . . . . . . . . . 1600–2800mm, 64"–112"
- Capacity paper* . . . . . . . . 2.0–12.0 ton/hr
- Efficiency* . . . . . . . . . . . . Up to 98%
- Electricity . . . . . . . . . . . . . 8–12kW
- Compressed air . . . . . . . . . 100 psi / 7 bar

*www.mssoptical.com/plasticmax*

# L-VIS™

## High-Resolution Color and Shape Sorting System

Recent upgrades to both hardware and software of the L-VIS® high-resolution camera sorting system further improve the accuracy of color and shape separation of small particles.

The most successful applications include extracting high-value commodities from electronic waste, such as circuit boards and copper wires, or sorting shredded or granulated plastics by color.

## WireHawk™

The patented WireHawk™ software algorithm is specifically designed for electronic and metal scrap applications.

WireHawk™ provides customers with increased recovery rates for even the thinnest wires, resulting in higher returns for high-value commodities.

The combination of both WireHawk™ and ColorMask™ technologies open the L-VIS® platform up to many other applications.

## ColorMask™

ColorMask™ is MSS's proprietary illuminated reference technology. The most recent design update features improved sorting accuracy for materials with difficult colors and weak contrast, such as dark green circuit boards and black insulated wires.

The L-VIS® analyzes materials in flight over the ColorMask™ illuminated reference, which is adjustable in color and light intensity, for maximum contrast and accuracy.
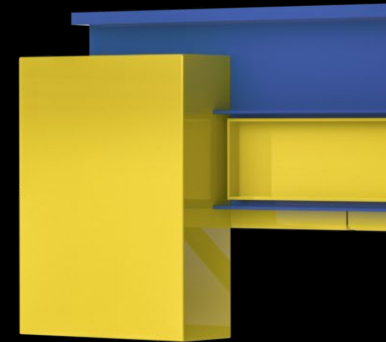
## Color Sorting of Non-Ferrous Metals
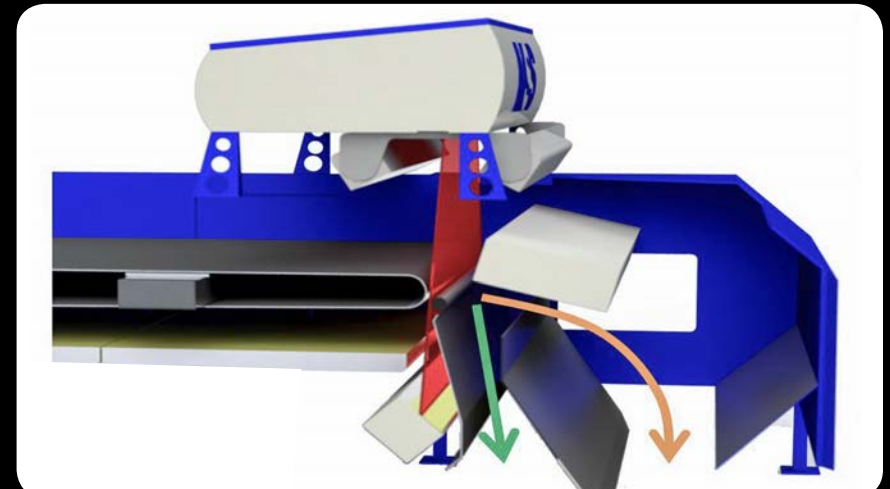

Brass + Copper from Aluminum


Copper Wire from ECS Fines


Wire from Stainless + Zurik


Color Sorting of Plastic Flake

## Features

- Detection options:
  - Over-the-belt
  - In flight with reflective reference
  - In flight over illuminated reference
- Single-eject configuration
- Color touchscreen with remote Ethernet access
- Language selection
- Change recipes by the touch of a button
- Continuous automated internal calibration
- Software license never expires

## Applications

- Electronic Scrap
- Metal Scrap
- Plastic Flake + Pellets
- Color/shape sorting onother small particles

## Upgrades

- All-metal detector
- Split Configuration
- Statistics/QC reports

## Machine Specifications

- Machine width . . . . . . . . 800–1600mm, 32"–64"
- Capacity E-Scrap . . . . . . . 0.5–3.0 ton/hr
- Capacity Metal Scrap . . . . 2.5–8.0 ton/hr
- Capacity Plastic Flake. . . . 1.0–2.5 ton/hr
- Efficiency*. . . . . . . . . . . . Up to 98%
- Electricity . . . . . . . . . . . . 5–8 kW
- Compressed air . . . . . . . . 100 psi / 7 bar

*www.mssoptical.com/l-vis*

# METALMiner™

## Sensor-Based Sorting of Ferrous, Non-Ferrous and Stainless Steel

The MetalMiner™ is an induction-based true all-metal sensor that sorts ferrous, non-ferrous, and stainless steel down to 1mm in size. It's the perfect solution to recover valuable metal fractions from e-scrap and ASR streams or remove metal contaminants from fiber streams, wood chips, plastic flake or glass cullet. Across the whole machine width, tightly spaced coil sensors analyze the material that runs over them by means of magnetic induction. As metallic particles are detected, electronic signals trigger precise ejections by individually controlled compressed air jets.

## MapLine™ Algorithm Technology

Our proprietary MapLine™ algorithm provides a noticeably higher purity of the eject fraction while maintaining or even improving the recovery rate, providing for a much faster return on investment such as extracting a significantly higher percentage of Zurik from ASR. It is able to distinguish between ferrous, non-ferrous and stainless steel.
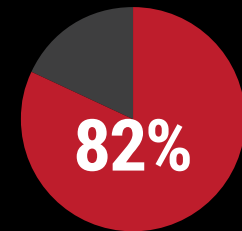
## MetalSort™ Upgrade

The MetalSort™ upgrade uses the same technology as the MetalMiner™ stand-alone unit, and can be integrated to any MSS optical sorter. It can be configured in a conveyor or slide setup. The sensor resolution is tailored to the specific processing application.

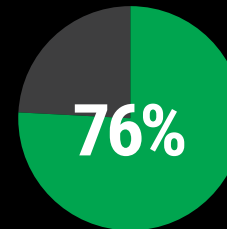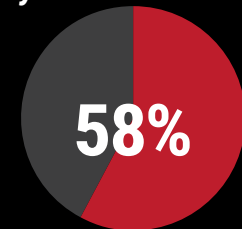## MapLine™ Algorithm Advantage

### Higher Recovery

**97%**
MetalMiner™
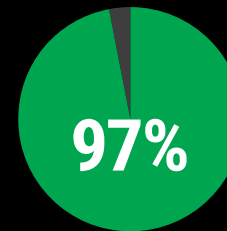
**82%**
vs. competitor
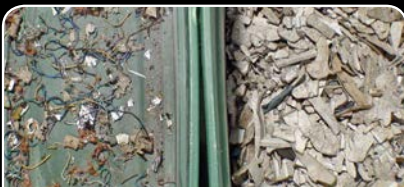
### Better Purity

**76%**
MetalMiner™

**58%**
vs. competitor

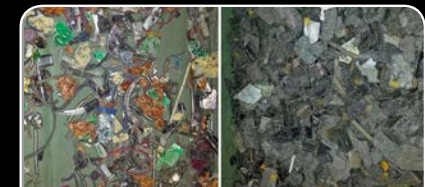## MetalMiner™ Sorting Applications


*Wires/Metals from E-Scrap*


*Stainless/Zurik from ASR/ELV*


*Wire/ICW from ASR/ELV*


*Copper/PCB/Stainless from E-Scrap*

## Features

- Single-eject configuration
- Color touchscreen with remote Ethernet access
- Language selection
- Change recipes by the touch of a button
- Continuous automated internal calibration
- Software license never expires

## Applications

- Electronic Scrap
- Metal Scrap/ASR
- Glass
- Plastic Flakes

## Upgrades

- Split Configuration
- Statistics/QC reports

## Machine Specifications

- Machine width. . . . . . . . . 800–2,800mm
- Capacity E-scrap* . . . . . . . 0.5–3.0 tons/hr
- Capacity metal scrap* . . . 2.5–8.0 tons/hr
- Capacity plastic flake* . . . 1.0–2.5 tons/hr
- Capacity glass cullet*. . . . 10–30 tons/hr
- Efficiency*. . . . . . . . . . . . Up to 98%
- Electricity . . . . . . . . . . . . 5–8kW
- Compressed air. . . . . . . . 100 psi / 7 bar

*www.mssoptical.com/metalminer*

**MSS**

*www.mssoptical.com*

**CPG**