



STEEL SCRAP RECYCLING

Your elemental ferrous purification equipment

STEINERT 
MAGNETIC + SENSOR SORTING SOLUTIONS

TO BENEFIT FROM SECONDARY SCRAP IT HAS TO BE SORTED

STEINERT sorting equipment aids in the production of pure, clean steel. It is key to unlock the value of ferrous scrap streams and avoid potential steel mill penalties and to refine the pathway to a circular economy. The steel recycling industry is one of the oldest and most important members of the recycling community. With electric arc furnaces in the value chain, ferrous scrap purity continues to pressure resource efficiency.

It is the use of steel scrap in new steel production, not iron ore and coking coal, that preserves natural resources. By recycling steel, scarce raw materials are preserved,

energy is saved, and the environment is spared considerable carbon dioxide emissions along with other waste products.

For every ton of steel scrap that is used instead of primary raw materials in steel production, 1.67 t of ore and 0.5 t of energy resources (coal, coke, heavy fuel) do not need to be mined, transported long distances, and consumed.* For these reasons, the phrase “Green Steel” has been coined and entered everyday use.

But producing recycled raw materials for the manufacturing industry, first requires the materials to be sorted. Our Solution Guide will show how to best clean your steel scrap.

// Typical applications and demand:

- + Recovery & purification of ferrous scrap from shredder scrap
- + Cleaning of heavy melting scrap HMS (E1/3) from shear scrap processing
- + Recovery & upgrade of ferrous products from e-scrap or lighter mixed scrap materials

*Source: Federal Association of German Steel Recycling and Disposal Companies (BDSV), in “Climate protection is made from scrap”, 12/2021

WORLDWIDE INSTALLATIONS



STEINERT SteelMaster installation underway in an end-of-life vehicle recycling plant in Belgium



STEINERT SteelMaster in an end-of-life vehicle recycling plant in the UK

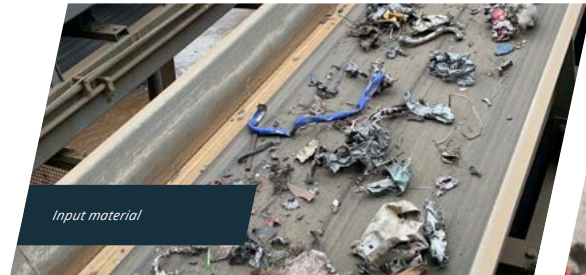


STEINERT MTE Q removes residues and non-ferrous materials in a recycling plant in Spain

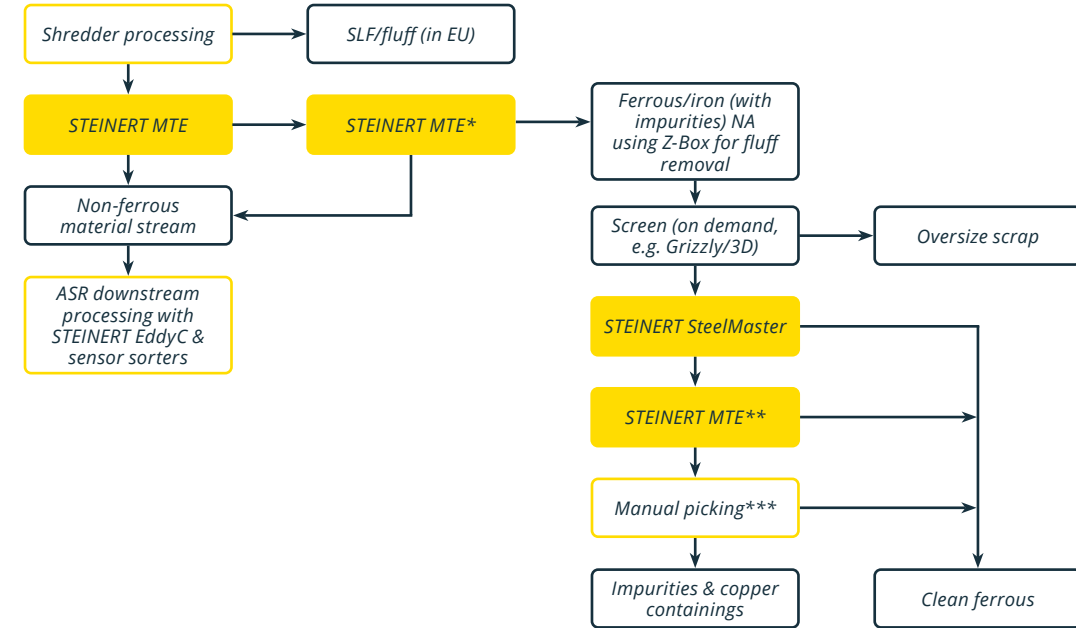


STEINERT MTE Q cleans steel in North America

1. HOW TO CLEAN THE FERROUS PRODUCT FROM END-OF-LIFE VEHICLE (ELV) SHREDDED SCRAP



FERROUS UPGRADE FROM STANDARD SHREDDER PROCESSING



* Example of maximum recovery and quality of ferrous materials with 2-step STEINERT MTE (STEINERT MTE Q Hybrid and/or STEINERT MTE Q)

** Optional: STEINERT MTE for magnetic & ballistic final clean-up of STEINERT SteelMaster ferrous throw

*** Picking efforts will be reduced significantly by impurity concentration and picking station that will be relocated onto STEINERT SteelMaster throw or STEINERT MTE drop

OUR SORTING SYSTEMS FOR CLEANING FERROUS PRODUCT FROM END-OF-LIFE VEHICLE (ELV) SHREDDED SCRAP

Recover iron



STEINERT MTE Q

Our magnetic drum increases the efficiency of sorting plants by generating clean ferrous scrap. The STEINERT MTE Q means you can reliably remove iron from various sortable materials or recover high-purity ferrous fractions. In the case of the classic magnetic drum that operates in a traversing manner, the bulk material is evenly distributed via a feed chute and placed onto the rotating magnetic drum. Here magnetic particles are retained on the surface of the drum

and recovered, whereas non-magnetic ones follow the laws of gravity and fall down. Material flows with a high iron content can thus be prepared for further differentiated sorting processes.

Working widths: 800 – 3,400 mm
Diameter: 800 – 1,800 mm



For the physical separation of copper “meatballs”



STEINERT SteelMaster

The sorting system works with a combination of ballistic and magnetic effects. It separates over 90% of all copper meatballs, waste and free copper wires from a heavy ferrous fraction. Its ballistic properties mean that around 20-30% of the material is separated, leaving around 70-80% of the input material as a very magnetic and mainly copper-free ferrous product that can be marketed accordingly.

The purely physical basis of the separation principle means this technology provides

a low-cost solution. The STEINERT SteelMaster is designed as an in-line system for scrap recycling plants but can also be operated as a batch process.

Working width: 1,500 mm, 2,000 mm

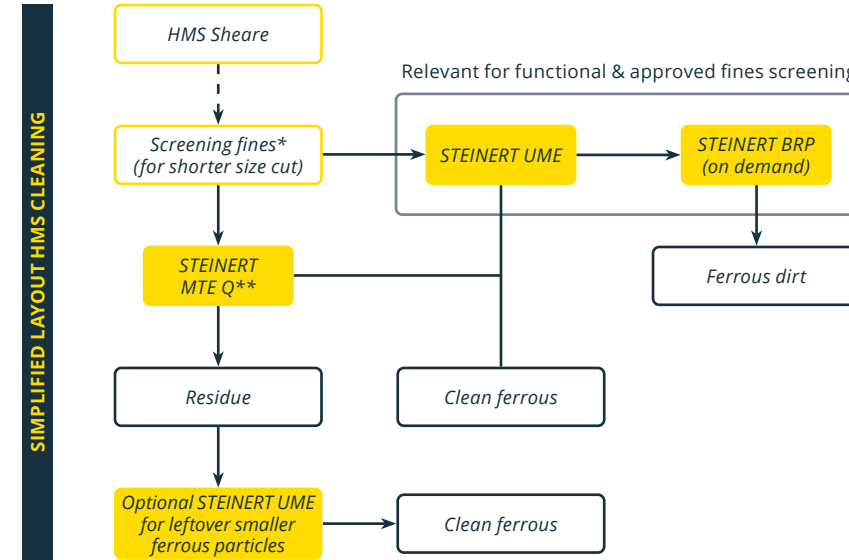
2. HOW TO CLEAN HEAVY MELTING SCRAP (HMS) – SHEARED E1/E3 FOR ELECTRIC ARC FURNACES



HMS input material



Removal of impurities and inert waste in HMS scrap



* Requirements for fines screening need to be checked on a case-to-case basis. Based on a screen use, one or two STEINERT UME are recommended

** Modified STEINERT MTE including special features for heavy-duty material

OUR SORTING SYSTEMS THAT CLEAN >90% OF RESIDUES FROM SHEARED HMS FERROUS SCRAP E1/E3



Layout 1: Set up with vibration feeder and STEINERT MTE plus STEINERT UME on STEINERT MTE drop material stream.



STEINERT MTE Q

Our STEINERT MTE Q magnetic drum is a variant of the classic MTE. It removes residues and non-ferrous materials by dropping them. The drum increases the efficiency of sorting plants by generating clean ferrous scrap. With the STEINERT MTE Q you can reliably remove iron from various sortable materials or recover high-purity ferrous fractions.

Working widths: 800 – 3,400 mm
Diameter: 800 – 1,800 mm



STEINERT UME

STEINERT overhead suspension magnets have been recovering iron and ferrous components from bulk material for many decades. The operating principle is based on deep-reaching magnetic field electromagnetic coils. An overhead suspension magnet is arranged above a feeding conveyor or belt and extracts the ferromagnetic materials from the supply flow against the force of gravity. Self-cleaning magnetic separators have a circulating conveyor belt, equipped with projections, which removes the ferrous parts attracted by the magnets and allows them to fall into a separate container.

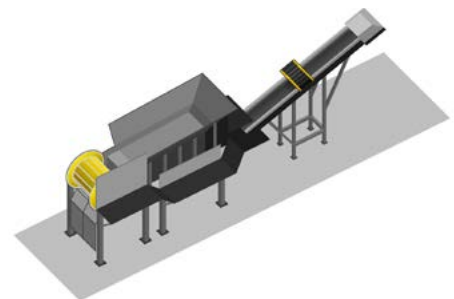
Working widths: 750 – 1,800 mm



STEINERT BRP

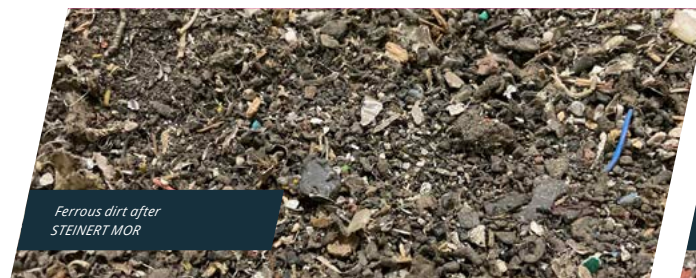
The STEINERT magnetic pulley guarantees high extraction rates of ferromagnetic materials. The pulley can also be used to separate out weakly magnetic materials like stainless steels or non-corrosive steels if strong permanent magnets are deployed with neodymium-iron-boron magnets. The head pulley is equipped with permanent magnets of different magnetic forces to satisfy the respective application requirements. Frequent STEINERT BRP applications include the recovery of valuable stainless steel concentrates.

Working widths: 300 – 2,000 mm
Diameters: 240 – 640 mm

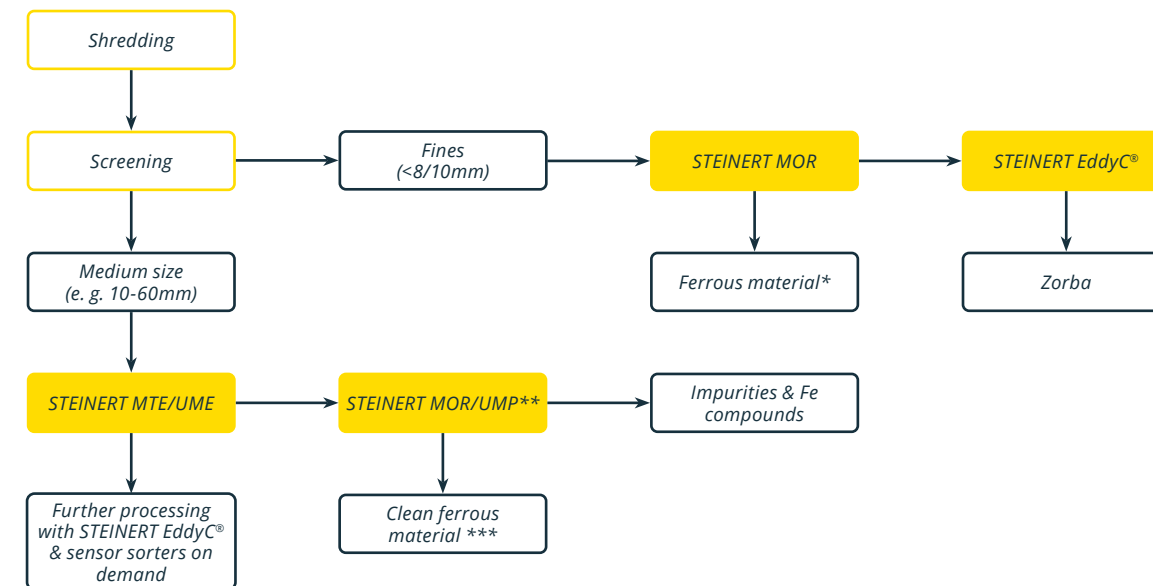


Layout 2: Set up with screen option and STEINERT UME for fine ferrous recovery and mandatory STEINERT MTE drum.

3. FURTHER SOLUTIONS FOR E-SCRAP AND LIGHTER MIXED SCRAP



SIMPLIFIED LAYOUT OF CLEANING MIXED LIGHTER & E-SCRAP



* The fines ferrous quality and marketing of the final product is heavily dependent on input source. E.g. small ferrous particles from e-scrap is a mix with non-ferrous/precious metals group compounds which often goes into copper melting products or further processing

** Multi-pole design

*** Depending of grain size and content of compounds, a second shredding step may be required to achieve the desired final purity

OUR SORTING SYSTEMS FOR CLEANING E-SCRAP AND LIGHTER MIXED SCRAP

First step



STEINERT MOR

This sorting system is a permanent magnet drum which includes an (open) vibration feeder for material infeed to the (STEINERT MTP) magnet. The drum ensures a very effective recovery of smaller and medium size free ferrous objects and ferrous compounds depending on picking or overflow STEINERT MTP set up. The STEINERT MPT is available with various magnetic material and design options and is mostly used upfront an eddy current separator.

Working widths: 450 – 1,950 mm



STEINERT EddyC®

The recovery of non-ferrous metals is the economic basis of every recycling system. STEINERT Eddy current separators with an eccentric pole system optimally meet this requirement – it is no coincidence that more than 4,000 of them are in use worldwide winning over customers through their high extraction volumes and durability. Following various processing stages, the non-ferrous metal separator facilitates the recovery of clean, marketable non-ferrous metal mixtures containing aluminium, copper, zinc or brass.

Working widths: 500 – 2,500 mm

Combination separator for ferrous and non-ferrous metal separation in Singapore



OUR SORTING SYSTEMS FOR CLEANING E-SCRAP AND LIGHTER MIXED SCRAP

Second step



STEINERT MTE Q

Our STEINERT MTE Q magnetic drum is a variant of the classic MTE. It removes residues and non-ferrous materials by dropping them. The drum increases the efficiency of sorting plants by generating clean ferrous scrap. With the STEINERT MTE Q, you can reliably remove iron from various sortable materials or recover high-purity ferrous fractions.

Working widths: 800 – 3,400 mm

Diameter: 800 – 1,800 mm



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STEINERT overhead suspension magnets recover iron and ferrous components from bulk material. The operating principle is based on deep-reaching magnetic field electromagnetic coils. An overhead suspension magnet is arranged above a feeding conveyor belt and extracts the ferromagnetic materials from the supply flow against the force of gravity. Self-cleaning magnetic separators have a circulating conveyor belt, equipped with projections, which removes the ferrous parts attracted by the magnets and allows them to fall into a separate container.

Working widths: 750 – 1,800 mm



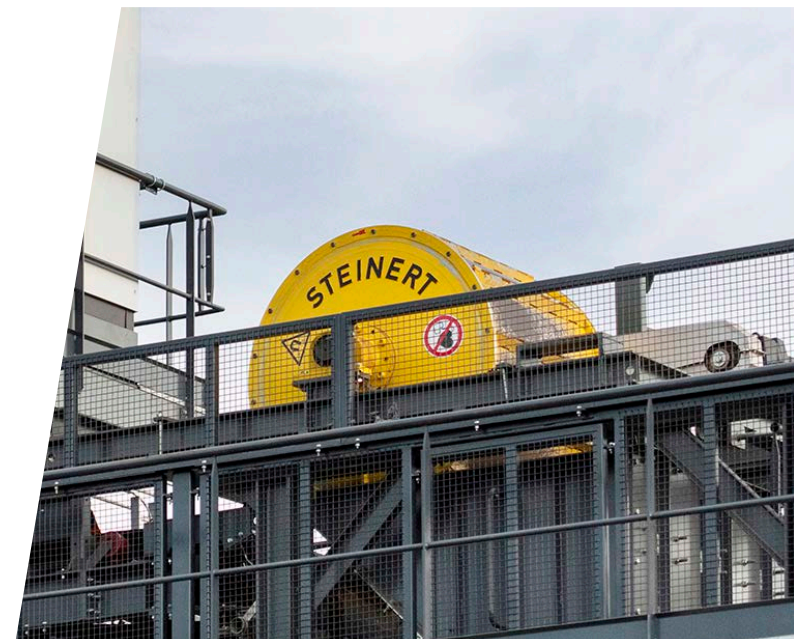
STEINERT UMP

The actual magnet in the UMP is very powerful due to its special structure and specific manufacturing method. Long parts are picked up on the belt and even difficult ferrous parts are attracted from a great distance. The latest generation enables deployment in locations where electromagnets still had to be used until recently. Permanent magnets are very energy efficient, since they do not require cooling. What's more, these days the belt can be changed without having to disassemble the entire sorting machine. Multi-pole designs facilitate the extraction of light ferrous parts and ensure reliable iron capture.

Working widths: 60 – 130 cm

Working lengths: up to 200 cm

*STEINERT MTE in a
sorting process in Belgium*



TEST BEFORE YOU BUY:

Test units available

In order to ensure maximum decisionmaking confidence when purchasing a sorting solution for steel recycling, we have STEINERT SteelMaster test units available to add at your existing shredder line.

Testing in real material flow verifies the equipment performance in terms of quality, yield and throughput.

Want to talk about setting up a test unit at your site? Simply get in touch with your personal STEINERT contact.



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MAGNETIC + SENSOR SORTING SOLUTIONS