

# Eddy Current Separators



## OPERATING PRINCIPLES

An even feed of mixed material is fed by way of a vibratory feeder onto the Eddy Current Separator which consists of a short centred belt conveyor, the rotor is positioned at the discharge end of this conveyor. The Rotor is constructed using a high-intensity rare earth (neodymium iron boron) magnet system which fits inside a non-metallic rotor cover. The rotor consisting of an alternating pole magnetic assembly spinning at high speeds induces eddy currents in conductive material that enters the magnetic field. Any conductive metals (brass, copper, aluminium etc) which enter the magnetic field are repelled over an adjustable splitter. The remaining non-conductive materials in the product stream follow their natural trajectory, free of the repelled conductive particles.



## APPLICATIONS

Eddy Current Separators are increasingly used wherever separation of non-ferrous metals from a product stream can give a more valuable or cleaner product. Whether the end use is in recycling, waste handling, raw material production or any other process where separation would prove beneficial.

### Typical examples of applications are:

- Extraction of non-ferrous metals from auto shredder residue.
- Separation of non-ferrous metals from solid waste incinerator ash.
- Sorting of aluminium beverage cans from dry recyclables.
- Removal of non-ferrous metals from shredded wood.
- Removal of non-ferrous metal contamination from crushed glass cullet.
- Separation of non-ferrous dross from foundry sand.
- Non-ferrous metal removal in WEEE recycling plants.
- Removal of aluminium components in UPVC window recycling.
- Separation of non-ferrous metals from domestic, industrial and skip waste in Material Recycling Facilities.



# HIGH INTENSITY ECS UNITS

The High Intensity ECS units are specifically designed for the separation of small and difficult particles, which require high repulsive forces.

High Intensity Units can be manufactured to operate on belt widths up to 2000mm enabling them to handle very large throughputs.



The technical features that are specific to the High Intensity ECS design are as follows:

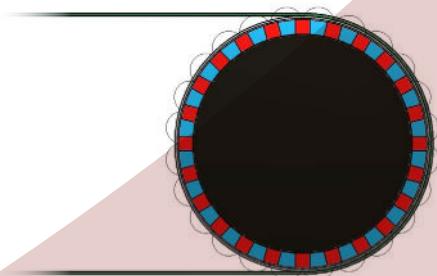
- **Rotor Position**  
The High Intensity Eddy Current Separator is available with an eccentric or concentric rotor depending on application requirements.
- **24 pole magnetic assembly**  
To allow for the separation of fine non-ferrous particles, The rotor of the High Intensity Eddy Current Separator is fitted with a 24 pole magnet assembly.
- **Variable rotor and belt speeds**  
The High Intensity ECS has variable rotor and belt speed features to allow customers to set the machine and achieve optimum separation of their product.
- **Belt change jacks**  
In order to make belt changes much easier, High Intensity ECS units are fitted with a hydraulic jacking system. The belt frame is cantilevered by way of the jack and held at an angle to facilitate a quick replacement.

# ROTOR POSITIONING

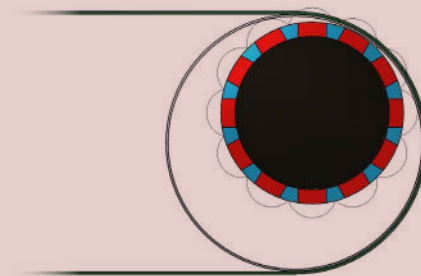
For applications that require separation of fine non-ferrous metals from a product flow Bunting manufacture a range of Eccentric Rotor design Eddy Current Separators.

The design and characteristics of this rotor arrangement give optimum separation of smaller particle size material such as WEEE scrap and PET flake type material.

- **Concentric rotors** consist of an alternating pole Rare Earth magnet system, which completely fills the space available within the separation rotor drum.
- **The magnet system** rotates at high speed within a few millimetres of the outer shell, this induces Eddy currents inside the material, resulting in very high repulsive forces.



- **Eccentric High Speed Rotor-** When employing an eccentric rotor, the unique magnetic assembly concentrates the magnetic forces where they are needed resulting in induction of stronger eddy currents in the conductive material.
- **High Speed Rotor-** Due to the smaller rotor diameter, high rotational speeds are achieved to increase separation of small particles.
- **Non Magnetic Zone-** with our eccentric design we have minimised the magnetic forces projecting below the rotor cover so that attracted ferrous falls away extending both rotor and belt life.



## **ECS 'R' TYPE**

**For the treatment of general household waste.**

The 'R' Type fits into the ECS range between the Can Sorter and the High Intensity ECS units, incorporating features of both machines.



### **Specific features of the 'R' Type ECS include:**

- **High throughput capabilities**  
The 'R' Type has a rotor diameter of 190mm and can be manufactured to fit belt widths of up to 1250mm
- **Variable rotor and belt control**  
The 'R' Type ECS has variable controls to allow customers to set the correct speed for meeting their specific separation requirements.
- **12 pole rotor**  
A 12 pole rotor is used on the ECS 'R' Type, the 12-pole rotor achieves separation of material with larger particle size.

## **THE CAN SORTER**

**The Can Sorter is specifically designed for the separation of non-ferrous beverage cans from dry recyclable applications.**

The Can Sorter ECS is a cost-efficient alternative to larger Eddy Current machines when applications are specifically target oriented.



### **Technical features that are specific to the Can Sorter units are as follows:**

- **Simplistic and cost effective design**  
The Can Sorter has a 122mm diameter, 6-pole rotor and is available with an effective width of up to 600mm. The Can Sorter was designed to be a more compact and simplistic unit than the larger machines in the range, whilst still providing efficient separation of aluminium cans.
- **Pre-set belt and rotor speeds**  
The belt and rotor speeds, which are usually variable on standard ECS units, are pre-set on the Can Sorter models to give optimum can separation.

## **COMMON DESIGN FEATURES**

**Bunting ECS units are built to combine the highest separating ability with a long and trouble-free operating life.**

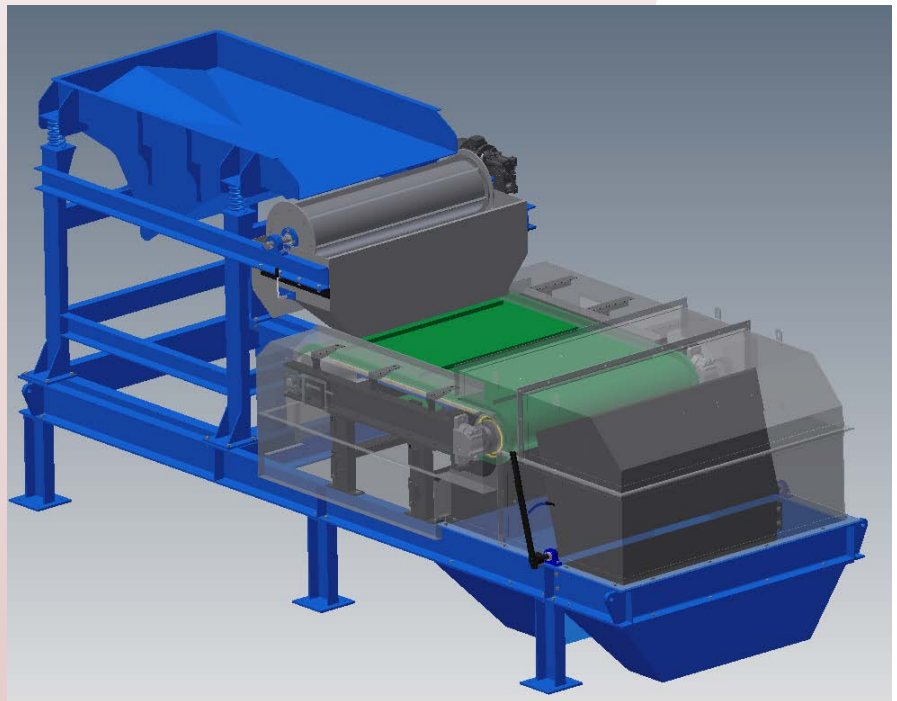
There are four versions of separator designed for different applications namely, High Intensity, Eccentric, 'R' Type and Can Sorter, as described here.

The rotors used on the Bunting range of ECS units are all dynamically balanced at 3600 RPM to ensure a trouble free operating life at operational speeds up to 3000 RPM.

Thin abrasion resistant PVC belts are used on the ECS units to further improve the separation capabilities of the Eddy Current Separator, minimising the gap between the product and the rotor.

The epoxy resin cover, which protects the rotors magnet system is also specially designed to be as thin as possible, whilst still giving the required strength.

A vibratory feeder produces a mono layer of feed material spreading the material evenly across the ECS belt conveyor thereby increasing the performance of our ECS units and enabling optimum separation.



## OPTIONAL EXTRAS

**Fine Ferrous particles can sometimes get caught between the rotor and the belt, causing substantial damage to the rotor cover.**

The key to avoiding this type of damage is to remove the fine ferrous particles present in the product stream, by installing a Rare Earth Drum Magnet following the Vibratory Feeder before the ECS, this is highly recommended.

Bunting can supply complete 'Turn-Key' plants to meet specific customer requirements, the plants can include infeed conveyors, diverter chutes and additional magnetic separation equipment such as Overband Separators and Stainless Steel Separators.

Bunting can provide support structure to ground level should it be required. Custom designed walkways can also be provided for around the ECS unit to allow for greater access to the machine and its components for maintenance and repairs.

Rotary or static cleaning brushes can be installed to remove product, which may get stuck to the Eddy Current Separators' belt. Bunting Sales Team can advise customers on these options if required.

## CLIENT SAMPLE TESTING FACILITY

Bunting has a sample testing facility and a mineral testing laboratory based in the UK, with experienced staff to ensure that the most suitable and cost-effective machinery is recommended for each application. Our testing facility houses a range of equipment, representing smaller scaled versions of our industrial product range allowing accurate scale up to industrial capacities.



*Bunting has over sixty years experience providing innovative magnetic solutions to industries involved in recycling, demolition and reclamation, mining and quarrying, food processing, ceramics production and powders and minerals processing. The Bunting range of systems are known for their high performance and reliable operations.*

*Please visit our website at [www.bunting-redditch.com](http://www.bunting-redditch.com) to view our full range of Equipment where brochure and video downloads are available.*

For more information on our full range of products please contact us on the contact details below.

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