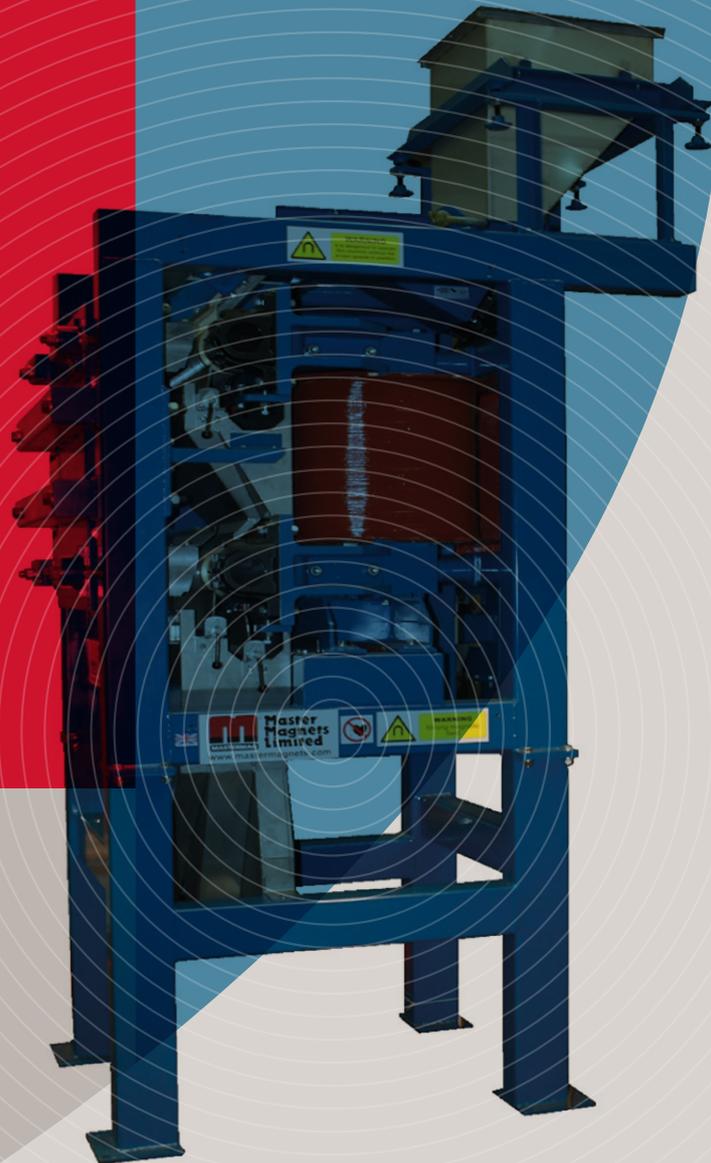


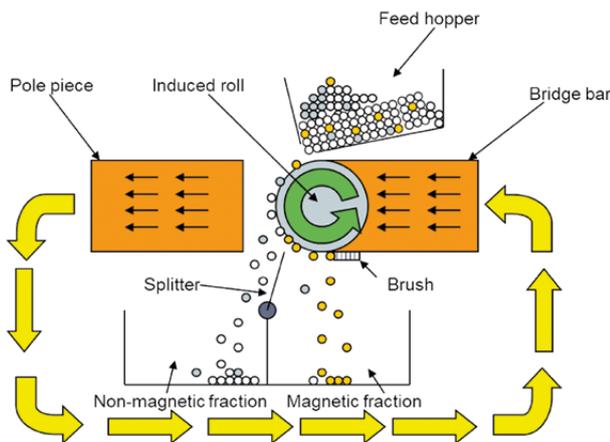
# Induced Roll Separators



The Induced Roll Separator is used for the continuous extraction of small paramagnetic particles from material to produce mineral purification for a wide range of mineral and ceramic processing industries.

## THE INDUCED ROLL SEPARATOR (IRS)

Induced Roll Separators are a versatile magnetic separator in which a powerful electro-magnet uses an iron circuit to induce a magnetic field in a rotating separation roll, set between fixed and adjustable magnetic poles.

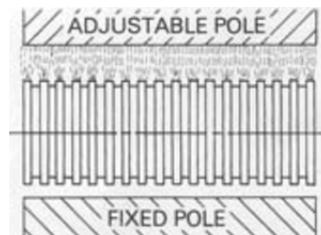


Principle of operation of Induced Roll Separator

A splitter plate is interposed between the two product streams. The machine can also be set up to give a middling stream by the addition of a second splitter plate. Two rolls can be mounted in series on the same unit to give a double pass machine for improved efficiency and process performance.

Pole/Roll design for induced roll separator.

Note serrated profile for maximum field gradient generation

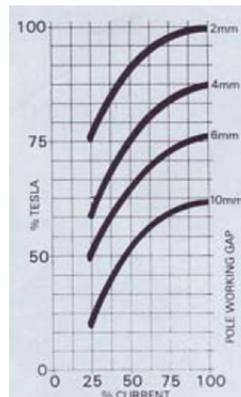


The roll design and electro coil design gives an infinitely variable field strength up to 2 Tesla on the roll surface allowing the efficient separation of weakly paramagnetic minerals.

The material being treated is fed from a hopper or vibratory feeder at a controlled rate onto a high intensity magnetic roll.

The paramagnetic material attaches itself onto the roll face or is deflected towards the roll.

Non-magnetic material is thrown off the face at a normal trajectory. Magnetic material is discharged off the roll face at a point of lower magnetic intensity aided by a brush.



Relationship between current and pole gap for IRS

### Key Facts: Induced Roll Separator

- High Magnetic Field Strength up to 2 Tesla (20,000 Gauss).
- Flexible Feed configuration.
- Machine design gives low carryover of fines into magnetics fraction.
- Separates weakly paramagnetic minerals from non-magnetics.
- Roll / Pole gap is adjustable allowing wide range of particle sizes to be processed.
- Capable of processing minerals in the -2mm, +45 micron particle size range.
- Roll speed is variable (typically 80-120 rpm).
- Splitter plate position adjustable.
- Manufactured in 500mm and 1000mm roll widths.

This type of separator has great flexibility for the process engineer, the magnetic field strength is variable due to the adjustable electromagnetic coil, the roll speed is adjustable and the roll/pole gap can be adjusted to accommodate different feed size ranges.

It can also process hot mineral feeds (up to 80-100 C) without compromising separation efficiency, unlike its permanent magnetic equivalent.

The roll also tends to generate very little static charge on the surface which means that there is minimal carryover of fine particles into the magnetics fraction – giving good grades and recoveries of valuable mineral from finer particle size distributions.

Typical capacities for a metre wide unit vary based on mineral type, density and particle size distribution and are ideally determined by laboratory test trials:

<b>Silica Sand:</b>	3-5 tph per metre roll width
<b>Ilmenite:</b>	4-6 tph
<b>Garnet Sand:</b>	3-6 tph
<b>Feldspar:</b>	3-5 tph

Various machine configurations are available; to meet client requirements the unit shown is a four-roll machine, with each roll 1,000 mm long.

The rolls are arranged in pairs so that the total flow was split between two rolls in parallel, each of these having a secondary roll to retreat the product.

Using this layout, a high degree of cleanliness was possible at a production rate of 8 tph on industrial mineral cleaning applications.

Other configurations are available using 1, 2, or 4 rolls, with roll lengths from 500 mm to 1,000 mm.



*Induced Roll Separator and control panel (500mm width, 2 roll unit)*

**Range of magnetic field strengths required for the separation of various minerals on IRS:**

<b>Biotite Mica</b>	<b>1.0-1.8 Tesla</b>
<b>Chromite</b>	<b>1.0-1.6 Tesla</b>
<b>Garnet</b>	<b>1.2-1.6 Tesla</b>
<b>Columbite</b>	<b>1.2-1.6 Tesla</b>
<b>Ilmenite</b>	<b>0.6-1.4 Tesla</b>
<b>Monazite</b>	<b>1.4-2.0 Tesla</b>
<b>Tourmaline</b>	<b>1.6-2.0 Tesla</b>
<b>Wolframite</b>	<b>1.2-1.6 Tesla</b>
<b>Hematite</b>	<b>1.3-1.8 Tesla</b>



*Master Magnetics Induced Roll Separator: 1 metre width, 2 pass unit used for processing nepheline syenite.*

## X-RAY FLUORESCENCE ANALYSIS (XRF)

X-ray fluorescence (XRF) is the emission of characteristic secondary (or fluorescent) X-rays from a material that has been excited by being bombarded with high-energy X-rays or gamma rays. The phenomenon is widely used for elemental analysis and chemical analysis, particularly in the investigation of minerals, metals, glass, ceramics, and building materials.

At our Bunting – Redditch test facility we can provide comprehensive chemical analysis of metal, mineral and soil samples by identifying elements such as Mg, Al, Si, P, S, Fe. It is also capable of precious metal and rare earth element analysis. This enables our technicians to make detailed and accurate recommendations on magnetic separation requirements and propose process flowsheet options to the customer.



## LABORATORY SAMPLE TESTING SERVICE

To arrive at the best separation criteria, Bunting uses a fully equipped laboratory for material testing to ensure optimum equipment selection. Customers are invited to submit samples for testing and evaluation, to ensure that separation performance can be measured, with all the results and process recommendations being submitted for the client's approval. Initial trials are normally carried out free of charge and customers are encouraged, if practicable, to participate in the testing and processing procedure.

In addition, Bunting have an established a working association with the Centre for Critical and Strategic Metals at the University of Birmingham. This link provides access to an extensive range of mineral processing and recycling facilities and additional expertise.

*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.mastermagnets.com](http://www.mastermagnets.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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