Bunting-Redditch
Burnt Meadow Road
Redditch, UK
B98 9PA
Tel: +44(0)1527 65858
sales.redditch@buntingmagnetics.com
www.bunting-redditch.com

Minerals Testing Laboratory

DATA SHEET

Bunting offers laboratory testing for customers and their minerals samples using our magnetic separation equipment. The results of this testing can indicate the most suitable equipment to use in the industrial process. The analysed results provided to the customer enables the most cost-effective and suitable machinery to be specified. This is essential before committing to the capital spend of industrial sized equipment.

The laboratory employs scaled down versions of the equipment which give representative results to the industrial scale units. The samples can be analysed before and after processing using X-Ray Fluorescence and X-Ray Diffraction analysis for chemical assay and mineralogical identification to aid the development of a viable process route for each application.

Here are a selection of typical minerals that can be separated, along with the magnetic flux density required

Mineral \ Magnetic Intensity (Gauss)	Zero Magnetic Response	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000	19000	20000	21000	22000	23000	24000
APATITE															←				→						
BIOTITE											←								→						
CALCIUM CARBONATE	■																								
CHROMITE											←						→								
COLUMBITE													←				→								
FELDSPAR	■																								
GARNET													←						→						
GOETHITE																←			→						
HEMATITE														←					→						
ILMENITE									←								→								
LIMONITE																	←				→				
MAGNETITE		↔																							
MARTITE			←		→																				
MONAZITE															←				→						
MUSCOVITE																←								→	
NEPHELINE SYENITE	■																								
OLIVINE (FAYALITE)												←		→											
PYRRHOTITE			←		→																				
QUARTZ	■																								
QUARTZ (IRON STAINED)																			←						→
TALC	■																								
TANTALITE													←					→							

Bunting-Redditch
Burnt Meadow Road
Redditch, UK
B98 9PA
Tel: +44(0)1527 65858
sales.redditch@buntingmagnetics.com
www.bunting-redditch.com

Minerals Testing Laboratory

DATA SHEET

The range of laboratory scale magnetic separators include the following:

For Dry Mineral Processing
Magnetic Disc Separator
Rare Earth Roll Separator
Induced Roll Separator
Electrostatic Separator
Ferrite and Rare Earth Drums

For Wet Mineral Processing
Electro Magnetic Filter
Wet test slide
Wet High Intensity Separator

Equipment Used in Recycling
Eddy Current Separator
Stainless Steel Separator
Electrostatic Separator
Ferrite and Rare Earth Drums
Rare Earth Roll Separator

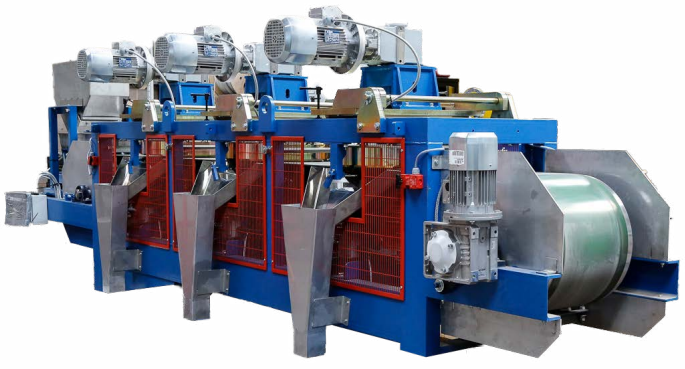
These products are used in mineral processing laboratories and as research tools at universities across the world. These types of laboratory scale equipment are available for sale.

Examples of magnetic separation equipment used in the test facility

For Dry Mineral Processing

Magnetic Disc Separator

Typical applications include:
- Processing of Tantalum Ore/ Coltan
- Concentration of Columbite-Tantalite, Ilmenite, Garnet, Monazite, Wolframite etc
- Processing of Tin-Ore
- Purification of Quartz for glass manufacturing
- Purification of abrasives



Rare Earth Roll Separator

Typical applications include processing:
- Feldspar
- Silica Sand
- High purity quartz
- Garnet
- Talc
- Abrasive and refractory minerals including Corundum
- Beach Sands (ilmenite, etc)
- Fine iron ores

Bunting-Redditch
Burnt Meadow Road
Redditch, UK
B98 9PA
Tel: +44(0)1527 65858
sales.redditch@buntingmagnetics.com
www.bunting-redditch.com

Minerals Testing Laboratory

DATA SHEET

Induced Roll Separator

Typical applications include processing:

- Apatite
- Baddeleyite
- Barite
- Calcite
- Cassiterite
- Corundum
- Feldspar
- Flint Clay
- Glass Sands
- Kyanite
- Limestone
- Mica
- Mullite
- Nepheline Syenite
- Petalite
- Quartz
- Rutile
- Scheelite
- Silicon Carbide
- Spodumene
- Wollastonite
- Zircon

Electrostatic Separator

Typical applications include:

- Wire recycling:
  - Separate plastics from copper and aluminium
  - Separate copper and aluminium
- Secondary metal recycling
- Mineral processing (e.g. used in conjunction with high-intensity magnetic separators in separating beach sands);
- Plastic recycling (e.g. shredded window frames separating aluminium from plastic);
- WEEE

For Wet Mineral Processing

Electromagnetic Filter

Typical applications include:

- Clean ceramic glazes
- Purify ceramic slips and bodies
- Remove magnetics and paramagnetic minerals (e.g. hematite, ilmenite, chromite) from mineral slurries including:
  - Silica sand;
  - Feldspar
  - Ball clay
  - Kaolin
  - Calcium Carbonate
  - Talc

Bunting-Redditch
Burnt Meadow Road
Redditch, UK
B98 9PA
Tel: +44(0)1527 65858
sales.redditch@buntingmagnetics.com
www.bunting-redditch.com

Minerals Testing Laboratory

DATA SHEET

Example of a typical magnetic separation laboratory test and analysis

As part of the testing service we provide a mass balance and XRF chemical analysis of the separation process, a typical result can be seen below (XRD can be organised through a third party). In this instance data from a test programme on a Tin (Sn) ore is presented.

The Magnetic Disc Separator used for this application has six coupled outputs at differing magnetic intensity and a final non-magnetics output. Each of the outputs are analysed to assess the elemental constitution present. These outputs can have a commercial value or have high concentrations of unwanted elements. In this case there is a commercial value in outputs 1 & 2 which are ilmenite rich. In the case of unwanted elements outputs 3 & 4 take out all the thorium.

The table below shows the concentrations of the elements present in the original sample and the subsequent magnetic disc separator outputs:

		Tin	Iron	Thorium	Titanium	Tantalum	Niobium	Others
	% Mass	Sn	Fe	Th	Ti	Ta	Nb	
Input Feed		49%	6.6%	0.5%	6.7%	0.6%	1.6%	35%
Output 1	6.6%	2%	20%	-	26.6%	1.3%	6.6%	43%
Output 2	0.9%	-	16%	-	22.4%	2%	7%	53%
Output 3	10.9%	16%	-	4%	-	-	-	80%
Output 4	2.5%	18%	-	3%	-	-	-	79%
Output 5	6%	62%	-	-	-	1.4%	1.8%	35%
Output 6	2.2%	63%	3.3%	-	-	-	-	34%
Non-Magnetics Output	70%	63%	-	0%	-	0.4%	0.75%	

As seen in the results table above, the non-magnetics output is 63% Tin compared with the 49% in the input feed. There is no Thorium, making it more valuable and easier to ship globally. The Thorium being removed at outputs 3 & 4. The rich concentration of Titanium has a commercial value and is removed at outputs 1 & 2.