

Low Intensity Magnetic Separator



Mineral Technologies offers a range of Wet Low Intensity Magnetic Separators (LIMS) to the Iron Ore Industry. The separators are designed on Ansys and Maxwell magnetic circuit verification software and most importantly performance verified in our in-house metallurgical testing laboratory in Australia, in order to meet the demands of improved capacity, metallurgical performance and mechanical availability.

Configurations Available (Model Range)

The range of wet magnetic separators is composed of the series WDS600; WDS900; WDS1200 with drum diameters of 600; 900; 1200mm and magnetically effective drum lengths from 300mm up to 3500mm. These ranges are available with concurrent, counter-current and counter-rotation tank designs.

Applications

The wet magnetic separators are primarily used for cobbing, roughing, cleaning and finishing purposes. Concurrent and counter-current separators are designed for both single; double and triple multistage arrangements. We also offer custom designs for stacked configurations as required by the process flow sheet.

Magnetic Separation Technology

Selecting a suitable magnetic separation field is essential to optimised LIMS performance to ensure that each particle is subjected to a series of forces including gravity, hydrostatic drag and magnetic gradient to improve recoveries.

The magnetic circuit is designed to produce certain strength (magnetic flux density, measured in Gauss and a magnetic field gradient measured in G/mm. Tighter stacked (smaller) pole pitches will produce a lower flux densities but at higher force gradients (High Gradient), which means it offers a higher magnetic attraction (expressed as $B \cdot dB / dx$) close to the drum which decreases rapidly with the distance away from the drum. It has a greater ability to recover finer and less magnetic particles, but has a lower throughput capacity compared to a magnetic assembly with a larger pole pitches or axial poles

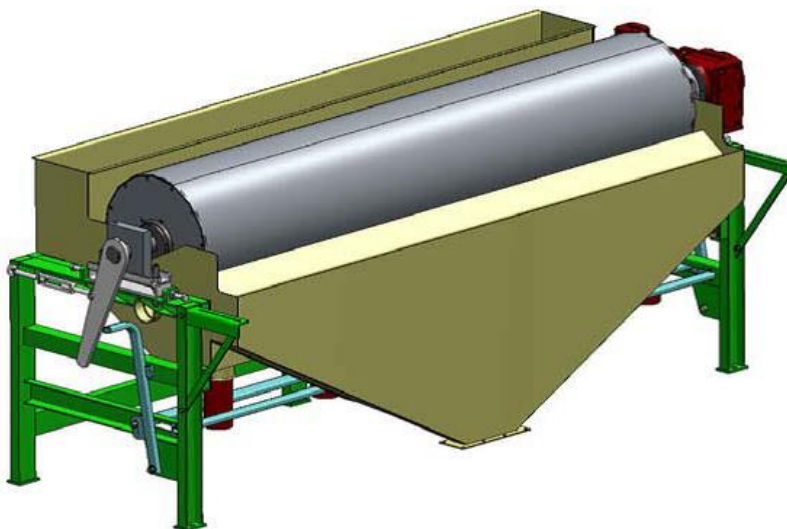
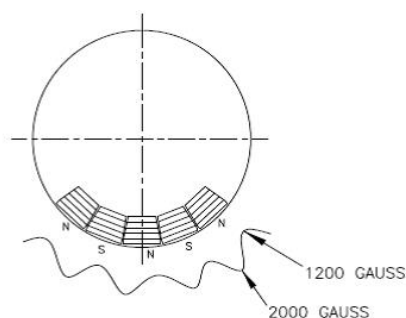


Image Above indicates a 600dia. x 3000mm long configuration

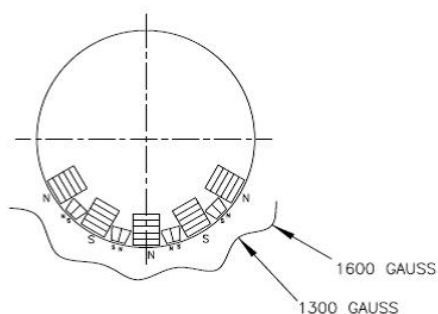
Design Features

MAGNETIC CIRCUIT - The magnetic circuit is available in

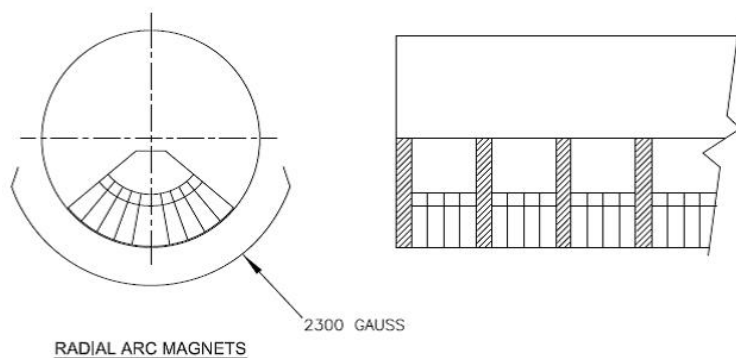
- Low gradient Multipole (4;5;6 Pole stacked magnets), 1200 to 2000 Gauss peak intensities at drum surface
- High gradient Interpole (High strength axial pole magnets), 1300 to 1600 Gauss peak intensities at drum surface
- Radial arc magnets, 1800 to 2300 Gauss peak intensities at the drum surface
- Rare earth drum magnets (MIMS range), 6000 to 6500 Gauss peak intensity at the drum surface
- Magnet Arc range from 112° to 135° , with an average of 1000 Gauss intensity at the drum surface as standard



LOW GRADIENT MULTIPOLE STACKED MAGNETS



HIGH GRADIENT INTERPOLE AXIAL MAGNETS



RADIAL ARC MAGNETS

Design Features

DRUM ASSEMBLY

- Direct drive through a bevel-helical gearbox with a direct-coupled electric motor.
- Drum assemblies have a magnetic circuit mounted inside of this non-magnetic drum by fixed methods to an axial support shaft.
- During operation, the drum revolves around the magnetic assembly and transports the magnetically attracted particles to the discharge end of the tank.
- The drum flanges and shell are non-magnetic stainless steel fabrications with an option of rubber or stainless steel wear covers available for abrasion resistance.
- All drums can be adjusted in the horizontal and vertical planes with limited axial adjustment.
- Bearings can be accessed and changed in situ if preferred.
- The drum peripheral speeds are between 1-1,5 m/s.

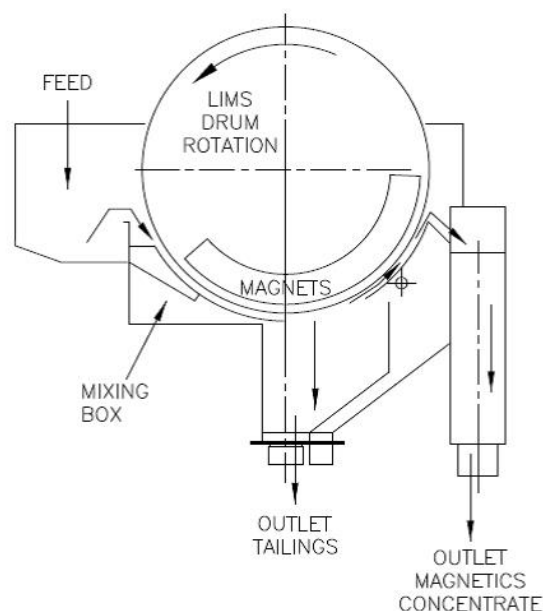
Tank Designs

CONCURRENT DESIGN (CC) – The Concurrent tank features:

- Feed box with removable protection screen
- Rubber lined distribution chambers
- Adjustable height settings of the drum to critical pick-up zone distances
- Drum rotates concurrently with the slurry feed and flow direction
- Adjustable outlet orifices for nonmagnetic effluent
- Selection of overflow weir plates to control pulp level in tank
- Wash water or dilution water manifolds optional

This tank design is mainly used for processing material with particle size up to 5mm at a feed rate capacity of 325 m³/hour/meter of drum width (120 T/hour/meter of drum width dry).

The pulp density optimal design is at 30 to 45% solids by weight



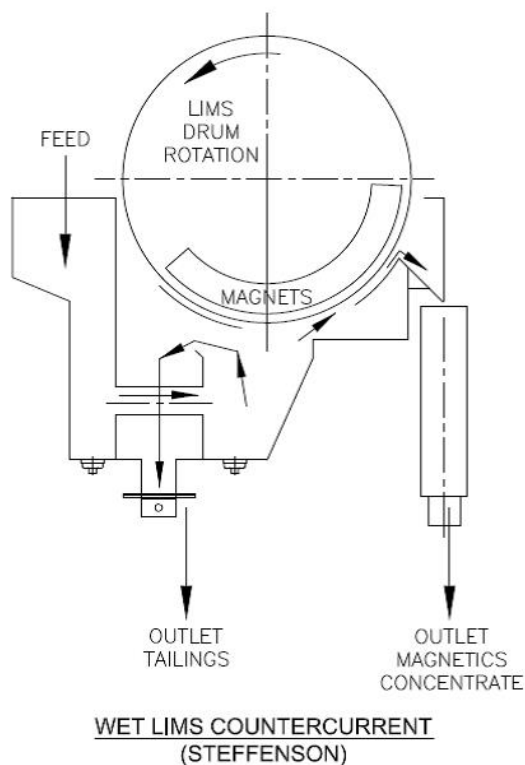
WET LIMS CONCURRENT

COUNTER-CURRENT DESIGN (CTC or Steffenson) – The Counter-current tank features:

- Slotted feed channel directing feed to the drum from below (perpendicular approach)
- Feed entry is lower down in the tank
- Drum revolving counter-current to the slurry feed and flow direction
- Selection of overflow weir plates to control hydrostatic level in the tank
- Steffenson tanks are capable of tolerating rather large fluctuations in feed flow rates
- Wash water or dilution water manifolds optional

This tank design is suitable for finer particle sizes up to 1mm and is preferred for cleaning and finishing stages at a feed rate capacity of 200 m³/hour/meter of drum width (50 T/hour/meter of drum width dry).

The pulp density optimal design is at 25 to 35 % solids

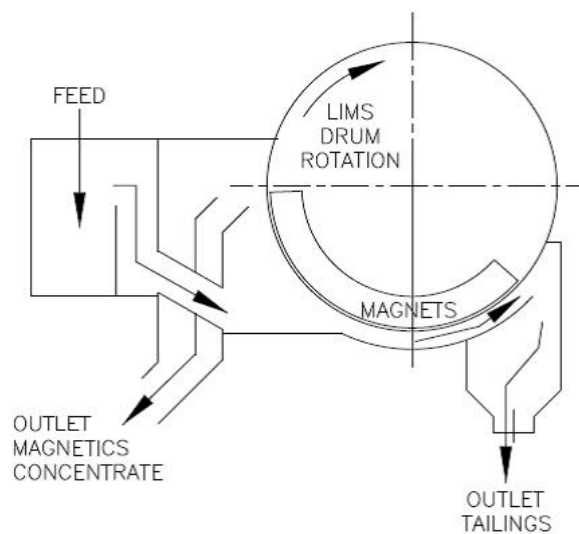


COUNTER ROTATION DESIGN (CR) – The Counter rotation tank features:

- Piped feed lines between the feed chamber and the tank under pan
- This allows for the feed side to be the same as the magnetic concentrate discharge side
- Maximised pick-up zone for highest magnetics recovery
- Drum rotates counter-current to the slurry feed and flow direction
- Full width effluent overflow tank is capable of tolerating rather large fluctuations in feed flow rates
- Level control by weir bars at tailings discharge is optional

This tank design is mainly used for roughing of medium to coarse particles up to 5mm at a feed rate capacity of 325 m³/hour/meter of drum width (100 T/hour/meter of drum width dry).

It is excellent for high capacity and recovery and preferred application is a single standalone unit or in a 'back to back' configuration but with independent feed chambers.



WET LIMS COUNTER ROTATION

Note:

Mineral Technologies reserves the right to alter specifications without prior notice.
 For Certified Drawings suitable for Engineering Design purposes please refer to Mineral Technologies