

# WET LOW/ MEDIUM INTENSITY MAGNETIC SEPARATORS



**SERIOUS**  
**ABOUT**  
**SERVICE**



**MALVERN**  
**ENGINEERING**

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# IMPROVED PRODUCT DESIGN



Malvern's Wet Low Intensity Magnetic Separators (WLIMS) have evolved over the years as a result of a continuous process of innovation and product improvement. Our skilled and dedicated engineering and design team as well as customers have contributed largely to this process. The development process targeted improvement in tank designs, magnetic circuits and special features in the machine to allow for easy adjustment of the parameters affecting performance. Emphasis has also been given to the safety aspects and ease of adjustment of the machine while in operation.

## PRODUCT RANGE

Magnet Width	305	610	915	1220	1525	1830	2135	2440	2745	3050	3355	3660
<b>DRUM DIAMETER</b> Ø380	○	○	○	○	○							
Ø610	○	○	○	○	○							
Ø760	○	○	○	○	○	○						
Ø915	○	○	○	○	○	○	○	○	○	○	○	○
Ø1220			○	○	○	○	○	○	○	○	○	○
Ø1500			○	○	○	○	○	○	○	○		

Note: Should you require a size which is outside the standard range given above please contact us.

## APPLICATIONS

- Recovery of magnetite in heavy media applications for coal.
- Recovery of ferro-silicon in heavy media application for diamonds, iron ore, chrome.
- Scalping magnetic material from a feed to the WHIMS/HGMS - hematite/chrome.
- Cobbing application for iron ore concentration
- Cleaner/re-cleaner and finisher application for ore concentration



## We offer the WLIMS in different configurations to suit the process and design requirements

- Back-to-back design incorporating a common manifold and concentrate launder.
- Combination of various tank and magnetic circuit designs on a single frame.
- Flexible design to suit the clients existing and new plant layouts.

# DESIGN FEATURES

## TANK DESIGNS

APPLICATION	TANK STYLE	FEATURES
Heavy Media Recovery and Iron Ore (Rougher Stage)	Counter Rotation	Separate tailings underflow and overflow outlets. Underflow is controlled via valves. Maximises recovery.
	Opti-Flow	Similar to counter-rotation but with single tailings outlet. Tank is self-leveling in design. Operational ease. An optional tank flushing system can be fitted to the tank.
Iron Ore Concentration	Counter Current	Recommended for cleaner and finisher applications. No tailings control required.
	Concurrent	Underflow valves are required. Drum rotates in the same direction as the incoming feed slurry. Recommended for coarser particle sizes.



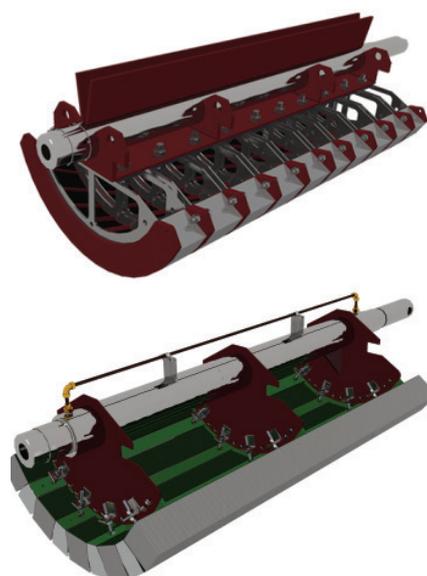
Note: All Tanks are manufactured in 304 St. St in thickness 3.0, 4.5 and 5.0 mm to suit the application.

## TAILINGS CONTROL

TYPE	FEATURES
Twin Orifice Plate	Easy to set and simple to maintain.
Counter Weight Orifice	Inexpensive, easy to adjust and reset if oversize particles become entrapped.
Manually Adjusted Valve	Allow for fine adjustments.

## MAGNETIC CIRCUITS

TYPES	FEATURES
Multipole (Radial Circuit)	<ul style="list-style-type: none"> <li>○ High surface intensity on the drum surface generated by this design creates a steep gradient and allows higher throughputs with improved recoveries.</li> <li>○ Reduced magnetite losses.</li> <li>○ High volumetric throughputs.</li> <li>○ Higher tolerance for variations in magnetic loading.</li> <li>○ 650 Gauss @ 50mm.</li> </ul>
Inter-pole (Axial Circuit)	<ul style="list-style-type: none"> <li>○ Alternating polarity delivers cleaner concentrates.</li> <li>○ 750 Gauss @ 50mm.</li> <li>○ 950 Gauss @ 50mm.</li> <li>○ 1150 Gauss @ 50mm (Only available in the Ø1220 size).</li> </ul>
High Gradient (Axial Circuit)	<ul style="list-style-type: none"> <li>○ 500 Gauss @ 50mm.</li> <li>○ 800 Gauss @ 50mm.</li> <li>○ Typically used in Ore Concentration applications.</li> </ul>
Medium Intensity (Axial Circuit)	<ul style="list-style-type: none"> <li>○ 3000/4000 Gauss on the drum surface.</li> <li>○ 6000 Gauss on the drum surface.</li> </ul>

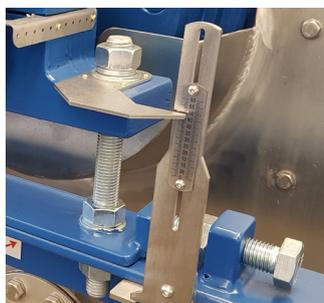


## MATERIALS OF CONSTRUCTION

ITEM DESCRIPTION	MATERIAL
End Flanges	<ul style="list-style-type: none"> <li>○ Aluminium.</li> <li>○ 304 St. St</li> </ul>
Drum Shell	<ul style="list-style-type: none"> <li>○ 3.0 and 4.5mm 304 St. St -special applications Ø915, Ø1220 and Ø1500</li> </ul>
Wear Wraps	<ul style="list-style-type: none"> <li>○ 1.6 mm St. St - Special applications.</li> <li>○ 3.0 304 St. St - Standard for all diameters.</li> </ul>
Tanks/Launders/Safety Guards	<ul style="list-style-type: none"> <li>○ 3.0 and 4.5mm 304 St. St</li> </ul>
Support Frames	<ul style="list-style-type: none"> <li>○ Mild Steel.</li> </ul>



## SPECIAL FEATURES



Drum (Vertical adjustment)



Water Purge System



Magnet (Angular Adjustment)



Water Weir System



Self Adjusting Scraper Blade



HDPE Feed Manifold



Single Side Greasing Point



Tank Lining Options

## SAFETY FEATURES



# SIZING GUIDE

## Heavy Media Recovery Application (Magnetite/FeSi)

Loading Factors	Unit	Drum Diameter		
		915	1220	1500
Hydraulic Loading	M <sup>3</sup> /H/M	80-110	100 - 120	120 - 140
Magnetic Loading (MAX)	T/H/M	16	24	30

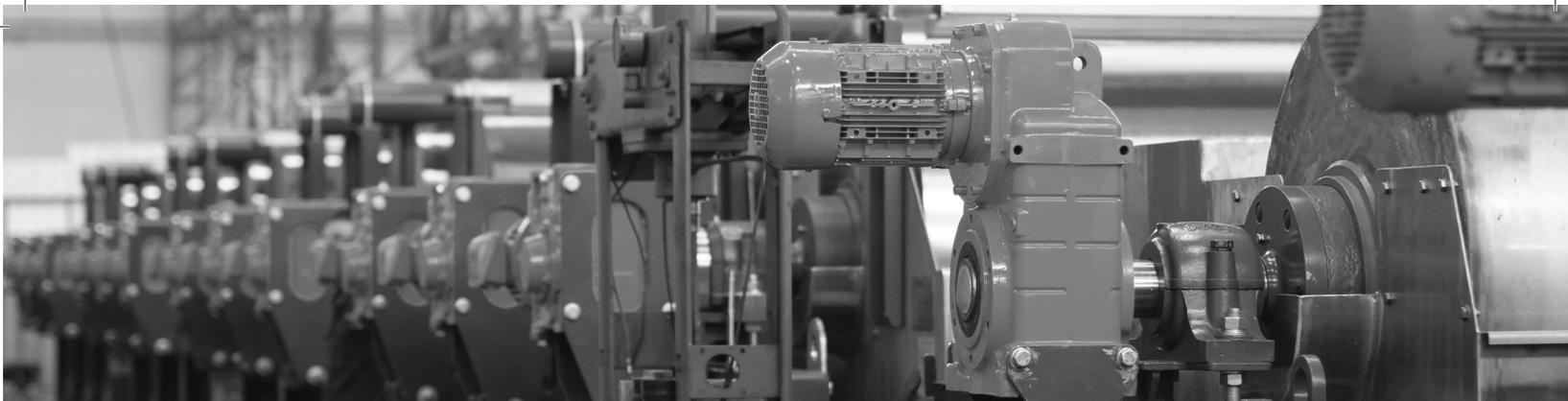
## Magnetic Ore Concentration (Copper/Rougher)

Loading Factors	Unit	Drum Diameter		
		915	1220	1500
Hydraulic Loading	M <sup>3</sup> /H/M	70-110	90 - 135	120 - 145
Magnetic Loading (MAX)	T/H/M	12 - 15	20 - 35	22 - 44
Recommended Tank Type	Concurrent/Counter-rotation type			
Particle Size	Coarse (Less than 10mm)			
Magnetic Circuit	Interpole (Ceramic Magnets)			

## Magnetic Ore Concentration (Cleaner/Finisher)

Loading Factors	Unit	Drum Diameter		
		915	1220	1500
Hydraulic Loading	M <sup>3</sup> /H/M	70-110	90 - 135	120 - 145
Magnetic Loading (MAX)	T/H/M	10 - 15	15 - 20	17 - 25
Recommended Tank Type	Counter Current			
Particle Size	Fine (Less than 1,0mm)			
Magnetic Circuit	High Gradient (Ceramic Magnets)			

Valves given are indicative and for reference only.  
Contact our offices for sizing of equipment and selection of the appropriate magnetic circuit.



## LABORATORY TEST FACILITIES

Malvern Engineering has a well equipped laboratory at their Johannesburg office. This facility allows for the quick and efficient testing of customer samples in a controlled environment.

## FIELD TRIALS

Malvern Engineering is able to supply tailor made pilot scale machines for onsite field trials fully supported by trained and experienced technical staff.



MALVERN ENGINEERING WORKS (Pty) Ltd

Tel +27 11 873 9010  
Fax +27 11 873 9596  
info@malvern.co.za

15 Indianapolis Blvd,  
Raceway Industrial Park  
Germiston, 1400, South Africa

PO Box 75002, Gardenview, 2047

[www.malvern.co.za](http://www.malvern.co.za)