

SUSPENDED ELECTRO MAGNETS



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RUGGED RELIABLE RECOVERY

SUSPENDED ELECTRO MAGNETS



Suspended Electro Magnetic Separators (SE Magnets) are typically installed above conveyor belts to remove large pieces of tramp metal that represent a hazard to downstream equipment such as crushers, mills, pulverisers and grinders; or to remove sharp metal that can damage or tear expensive conveyor belts, especially at transfer points.

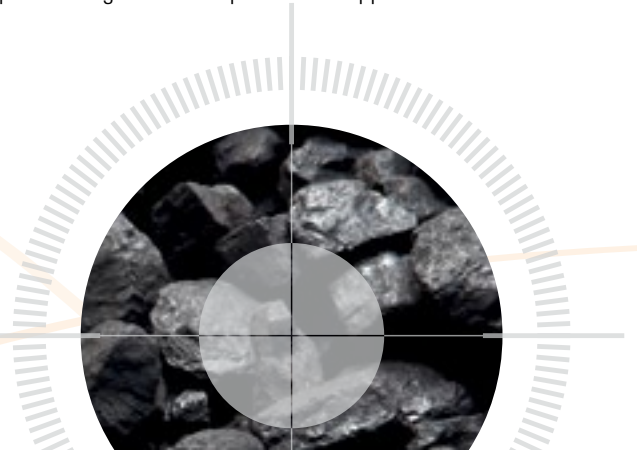


FEATURES

- Reliable and durable construction
- Robust design to withstand harsh operating conditions and heavy-duty applications
- All models designed for 24/7 operation
- Manual and self-cleaning models available, depending on amounts of iron contamination expected
- Installation across the conveyor belt, perpendicular or diagonally, or in-line over the discharge head pulley
- Oil expansion tank prevents condensation and protects against hot spots to extend coil life
- Special force cooled and/or rectangular core designs for high burden depths and/or wider belts

APPLICATIONS

- Automatic removal of small or large volumes of tramp iron from wide range of feed materials
- Special designs for explosion proof applications (compliant with European Atex regulations)
- Special design units for apron feeder applications



SPECIAL OPTIONS

- High flash point coolants
- Dust covers
- Full guarding / covers
- Permanent extension magnets to ensure ferrous is not discharged prematurely
- Monitoring devices (over temperature alert, belt rotation and belt misalignment switches)
- Atex certified units available



Suspended Electro Magnet with full guarding

MAGNET STYLES

MANUAL CLEAN (MC)

Manual Clean (MC) models are periodically de-energised in order to discharge iron accumulated on the face of the magnet. They are suitable for applications where the quantity of tramp iron in the product is low. These magnets are usually suspended from a travelling trolley so that they can be swung clear of the conveyor before switching off to release the iron.



SELF-CLEAN (SC)

Self-Clean (SC) models provide continuous, automatic removal of tramp iron and can be installed in an "in-line" or "cross belt" position. They are recommended where a large amount of tramp iron is expected or where there may be limited access to the magnet for cleaning purposes.



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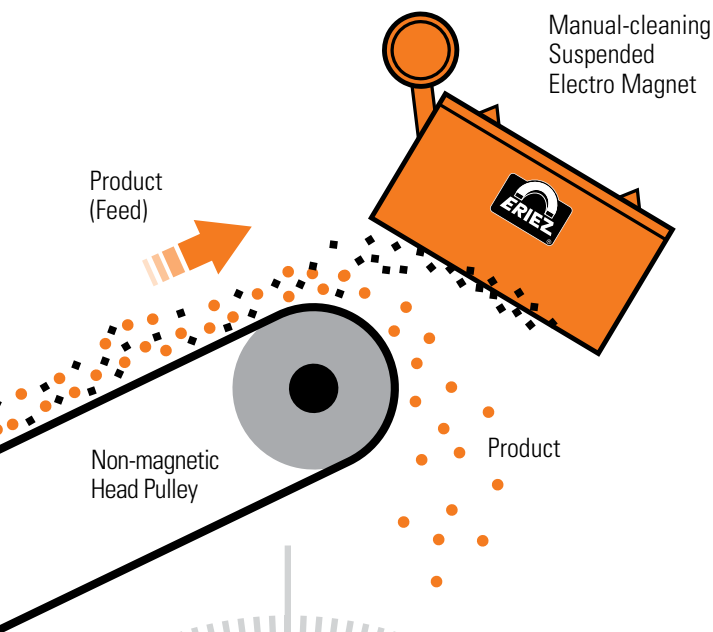


IN-LINE POSITION

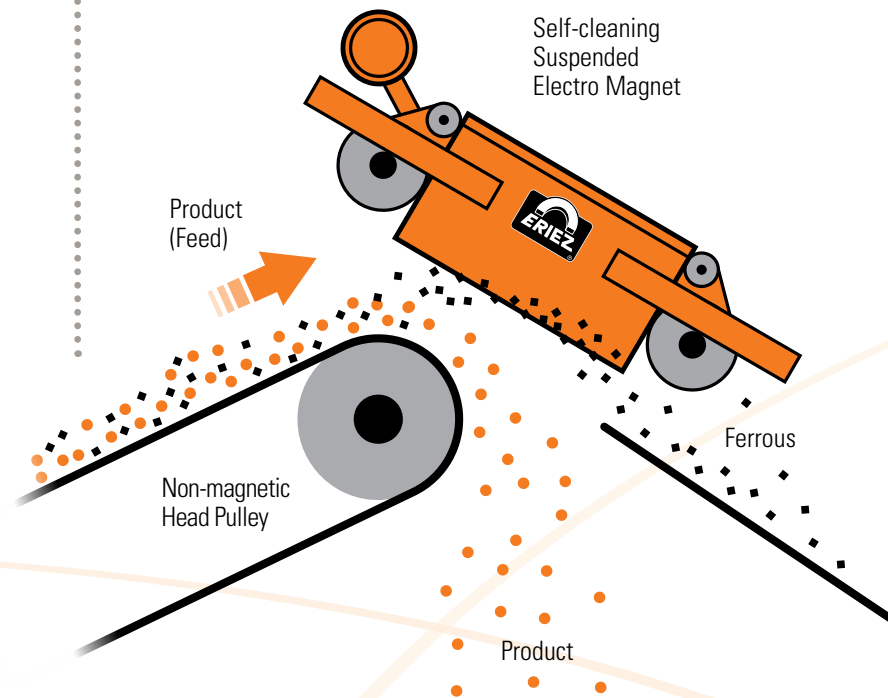
- Magnet suspended over the trajectory of material as it is discharged from the belt conveyor.
- This is the preferred option as it is the most efficient use of the magnetic separator i.e. when the burden is 'opened up' in flight and is moving directly toward the magnet face. The iron's momentum towards the magnet can assist in its separation.
- When the magnet is in this position, it is essential that the conveyor head pulley is made of a non-magnetic material.



MANUAL-CLEANING



SELF-CLEANING

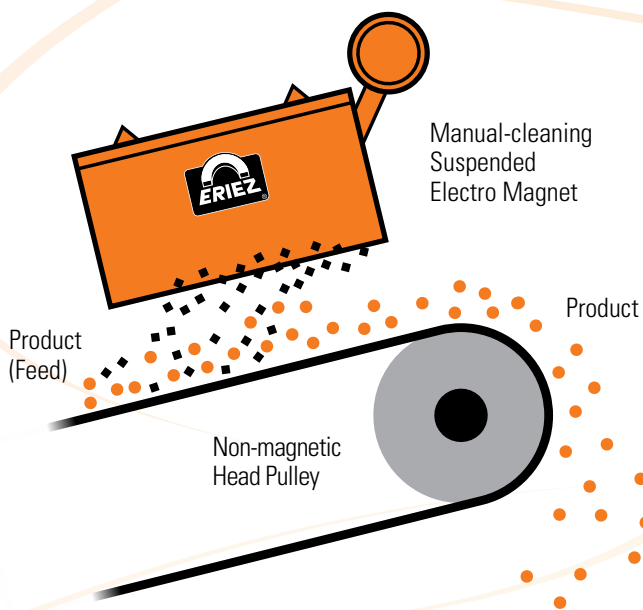




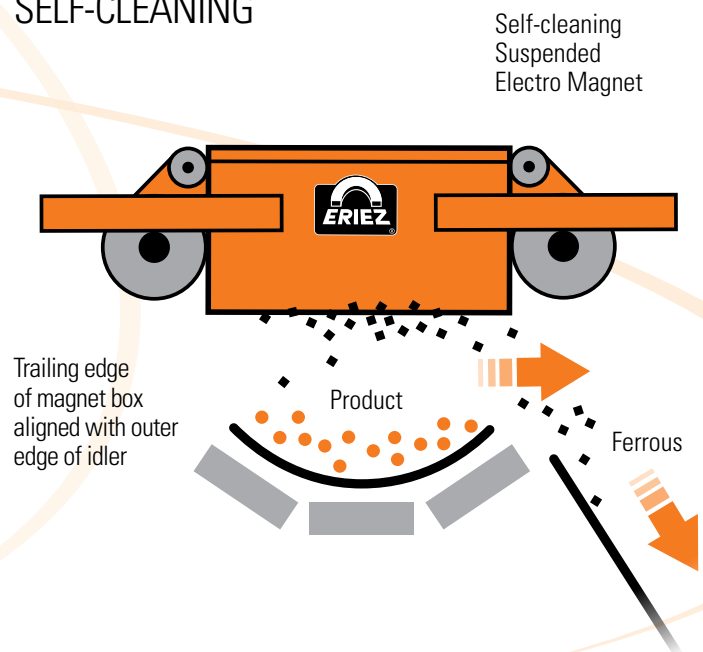
CROSS-BELT POSITION

- Magnet located over the moving bed of material and at right angles to the conveyor.
- This position requires a stronger magnet and is not recommended for excessive belt speeds or deep material burdens where the removal of smaller tramp iron is necessary.

MANUAL-CLEANING



SELF-CLEANING



IMPORTANT FACTORS IN MAGNET SELECTION

- | | | |
|---------------------------------------------------|--------------------------|-----------------------------|
| • Material lump size range | • Capacity t/hr or m3/hr | • Angle of troughing idlers |
| • Material type / bulk density / moisture content | • Conveyor belt width | • Ambient temperature |
| • Amount of tramp iron to be removed | • Conveyor belt speed | • Machinery to be protected |
| | • Conveyor belt incline | • Available AC power supply |
| | • Head pulley diameter | |



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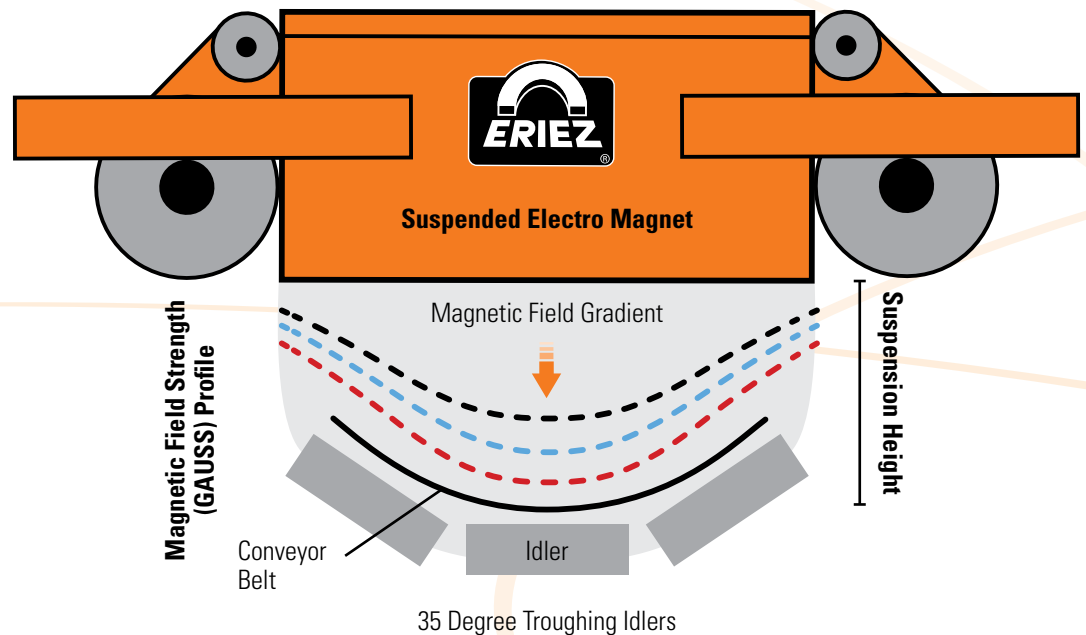
FACTORS INFLUENCING SEPARATION PERFORMANCE

- **Belt speed:** As the belt speed increases, it becomes more difficult to remove ferrous components. Larger, stronger SE magnets may be required for faster belt speeds.
- **Burden depth:** As the burden depth on the conveyor belt increases, a stronger magnetic field is needed to pull the tramp iron up through the material bed.
- **Size of ferrous component:** Small pieces of tramp metal may be extremely difficult to remove especially when they are covered by a heavy overburden of material, compared to large items like bucket teeth, rail spikes or rebar.
- **Shape of ferrous component:** Steel plate has a high surface area relative to its weight vs. a sphere which has the lowest surface area relative to its weight. Flat plates and rod shaped tramp metal are therefore easier to remove than spherical or cube shaped tramp metal.

MAGNETIC FIELD CONFIGURATION

Typical magnetic field configuration of an electromagnet suspended over a conveyor belt. The magnetic field extends outward from the centre of the magnet. The magnetic field is strongest at the centre and diminishes towards the edges.

Note: Non-magnetic idlers are recommended for beneath the magnet.



LARGE FORCE COOLED (LFC) SUSPENDED ELECTRO MAGNETS



Eriez' large force cooled suspended electro magnets are custom-built high performance electro magnets. They can be supplied in either manual clean or self clean arrangements.

FEATURES

- Custom designed for wide conveyor belts and feeders
- Provide cross-belt coverage on wider than average conveyor belts
- Generate a powerful magnetic field capable of penetrating deep burdens on fast moving conveyors commonly found in today's most productive mines
- Force cooled to achieve maximum separation performance and efficiency with given magnet box size
- Typically feature a rectangular core design to maximise separation performance over a wider conveyor bed

APPLICATIONS

- Used to remove large, unwanted tramp metal objects in hard rock and coal mining applications
- Ideal for belts conveying high tonnages of ore or coal, operating at high belt speeds and carrying deep burdens
- Available for apron feeder applications where typically slow-moving conveyors carry high tonnages with burden depths reaching 1.5 metres or more. The magnet is suspended at the discharge of the belt feeder, with a typical installation angle of 70° - 80°



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WWW.ERIEZ.COM

ERIEZ MAGNETICS EUROPE LIMITED

European Manufacturing, Design and Test Laboratory Headquarters

Greenway, Bedwas House Industrial Estate, Bedwas, Caerphilly, CF83 8YG, UK

T: +44 (0)29 2086 8501 | F: +44 (0)29 2085 1314 | E: info@eriezeurope.co.uk

