

# Magnetic Brakes

**Linear permanent magnet brakes** are a fail safe, power free, **deceleration system** that is used in conjunction with a metal reaction plate. Ceramic or rare earth magnets are bonded to a steel back iron plate. No input power is required.

They are used in applications such as **baggage handling and people moving systems, inclined material transfer lines and amusement park rides** to reduce the velocity of the payload to almost zero speed.

The **principal of operation** is quite simple. As an electrically conductive **reaction plate** moves thru a **permanent magnet** field at some velocity, eddy currents are produced in the plate. These **Eddy currents**, in conjunction with the magnetic field, produce a force that opposes the driving force of the plate. The result is a braking action on the conductive plate. The amount of braking is proportional to the velocity; the higher the relative velocity, the greater the braking force, the lower the velocity the lower the braking force. The net result of all of this is a **very smooth**, very controlled **deceleration** of the payload. If there is no relative velocity between the magnets and the conductive plate, no braking will occur. As a result the exit velocity will never be zero.

Depending on system configuration and total travel, either the conductive plate or the magnet assembly can be mounted to the vehicle or pallet system. The resultant energy from the braking system produces heat in the reaction plate. At higher velocities, more eddy currents are produced which results in more heat generation in the reaction plate. Since there is **no mechanical contact** between the reaction plate and the magnet assembly, there are no wearing parts and as a result no maintenance is required

Braking systems can be **custom designed** to have whatever exit velocity is desired, all the way down to almost zero speed.

## Linear Magnetic Brake Advantages:

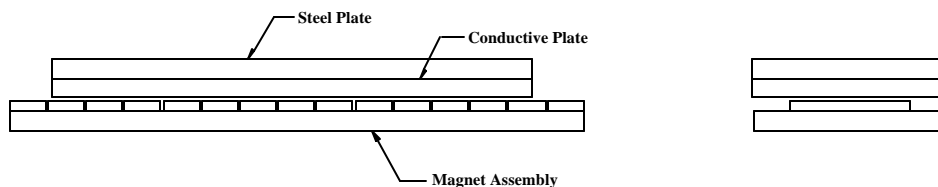
- Fail Safe (no power required)
- Efficient
- Custom Designs
- Ceramic or Rare Earth Magnets
- Maintenance free

## Applications:

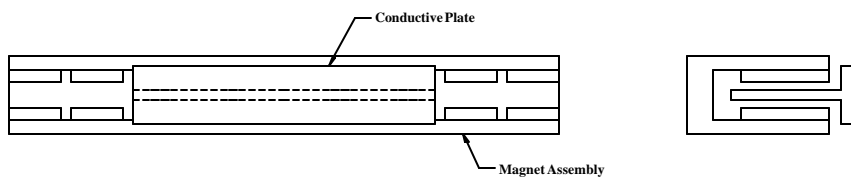
- Baggage Handling Systems
- People Moving Systems
- Material Transfer Lines
- Amusement Park rides

The linear magnetic brakes come in two configurations;

1. **Single sided:** The single sided brake is a lower cost solution but has open exposed permanent magnets. If the conductive plate is backed with a steel plate to increase the magnetic field in the gap (which in turn increases the braking) there will be a large magnetic attractive force between the 2 plates and the magnet assembly.



2. **Double Sided:** The double-sided brake allows for a thin conductive plate or fin to pass thru the "U" shaped permanent magnet assembly. In this case, there is no magnetic attractive force between the 2 members. This design offers more flexibility for mounting the brakes and does not have exposed magnets.



## Required Electronics:

No Electronics are required for brake operation

## Environmental Considerations:

If mounted in an environment that is wet or excessively dirty, consult factory to determine if sealed assembly is required. The magnetic assembly is highly magnetic, it should not be placed in an area where loose steel particles can be drawn into the magnetic gap. The brakes should not be mounted in an environment with high ambient temperatures (>50°C).

## Maintenance:

The linear magnetic brakes requires no maintenance except for the periodic inspection and removal of magnetic particles that may accumulate on the the exposed magnet surface.

## Ordering Info:

The linear magnet brakes are custom designed for each application. They are supplied in modular form, which allow for easy handling and installation. Consult factory for size and part numbers.