

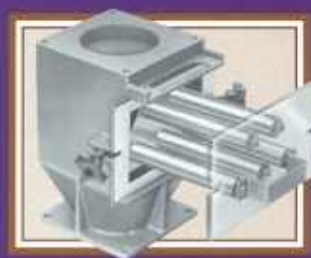
# Grate Magnets



Ensure product purity,  
protect equipment, and  
prevent costly downtime  
with Dings Co. standard  
and custom application  
grate magnets.

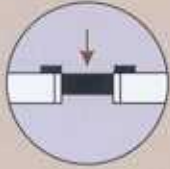


 **Dings**  
CO.  
magnetic group



# Grates for all Applications

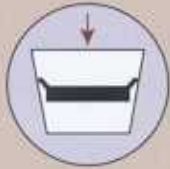
## IN FLOOR OPENING



## OVER HOPPER



## INSIDE HOPPER



## BENEATH HOPPER



Grate magnets remove small particles of ferrous metal from free-flowing powders and granular materials. These permanent magnetic separators are a very cost-effective and efficient way to remove damaging tramp metal and light concentrations of ferrous contaminants. They ensure product purity, protect equipment, and prevent costly downtime.

Grate magnets are so efficient because they work *inside* the product flow; there's no need for magnetism to reach through any great depth of material. Standard grate tubes are 1" in diameter, with a smooth stainless steel surface on the outside, and an assembly of ceramic or rare earth magnet material sealed inside. To produce a more uniform separating force, Dings grates contain magnetic material throughout the entire tube, and are not partially loaded with fillers.

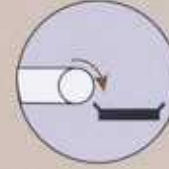
## CUSTOM APPLICATIONS ARE OUR SPECIALTY

If our standard models do not fit your application, we can custom fabricate a grate magnet to your exact specifications. A wide range of sizes, shapes, and transitions are available to match your chute system. If your material will not flow easily through a standard design grate, we can vary the staggered arrangement of the tubes, increase the spacing between the tubes, or make other modifications to accommodate your type of product. Dings Co. has been manufacturing magnetic separators since 1899, and we can apply a wealth of application knowledge to solve your separation problems.

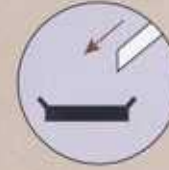
## COMPLETE SELECTION

A variety of designs is available to match flow capacity, location, degree of ferrous contamination, and cleaning convenience.

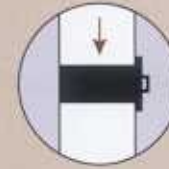
## BELOW CONVEYOR



## BELOW DISCHARGE CHUTE



## INSIDE VERTICAL DUCT



This huge 36" x 32" separator has eight pull-out drawers and was manufactured for a chemical processing plant.

UNHOUSED	DESCRIPTION	APPLICATION
TUBE	Single tubes filled with ceramic or rare earth magnet material	Custom-fabricated products or other unique applications
GRID	No frame; two cross pieces support magnetic tubes	Locations too confined for framed type, or for irregular openings
PLAIN FRAME	Magnetic tubes within a four-sided frame	General purpose
HEAVY-DUTY FRAME	Larger, square magnetic tubes; greater surface area; wider tube spacing	High volume applications, such as grain processing
WING TYPE	Plain frame with wings on sides to funnel material into grate	General purpose
DRAWER	Drawer can be pulled out of chute for cleaning	For installation in existing chute

HOUSED	DESCRIPTION	APPLICATION
STANDARD	Grate drawer contains magnetic tubes in a housing	General purpose
EASY CLEAN	Grate drawer contains tube-within-a-tube assemblies	For applications requiring greater cleaning convenience
AUTO CLEAN	Pneumatic system cleans rare earth magnetic tubes automatically	Inaccessible locations, or material with high ferrous contamination
ROTARY	Motorized, with tubes in circular arrangement	Prevents cohesive powders and fibrous materials from bridging
HOPPER	Slide gate, transparent drawer face, other industry-specific features	Plastics industry

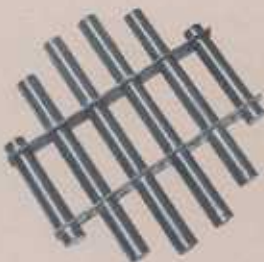


# Unhoused Grates

**TUBE MAGNET**



**GRID**



**PLAIN FRAME**



**TUBE** - Tubes are available in lengths from 3 inches to over 2 feet, filled with ceramic or rare earth magnetic material. End plugs are either plain or drilled and tapped 1/4-20.

**GRID** - Grid-style magnets don't have a surrounding frame, and can fit in confined spaces or irregularly shaped openings. They are easy to remove for cleaning. Tube ends are exposed. Magnet is supported by the cross bars or by the tube ends. Available in square, rectangular, or round for cone-shaped hoppers.

**PLAIN FRAME** - Magnetic tubes are held in place within a simple external frame.

**HEAVY-DUTY FRAME** - Extra-sturdy grate magnet is ideal for grain processing and other high volume applications. It can be mounted securely over a receiving pit opening to remove ferrous from grain stream. Features include larger 2" square tubes providing more magnetic surface area, wider tube spacing, and heavy-duty all-welded construction.

**WING TYPE** - Two sides of frame have angled panels to direct flow into grate.

**DRAWER** - This grate magnet pulls out for inspection and cleaning. Can be carried to another location for cleaning.

**HEAVY-DUTY FRAME**



**WING TYPE**



**DRAWER**



## Full-Line Specifications

### HOUSING CONSTRUCTION

- 11 gauge 304 stainless steel, 316L stainless steel optional.
- Hopper magnet is mild steel, with 304 stainless steel optional.
- Bead-blasted satin finish is standard; sanitary finish in product flow area is optional.

### SIZES

- Wide range of lengths and widths in square or rectangular shapes. For housed grates, size pertains to opening in drawer inside housing. Nonstandard sizes available.
- Std. housing height: 8" (Easy Clean: 7-1/2"). Other sizes available.

### ESTIMATED WEIGHT

- .15 lbs./square inch of area on unhoused single bank unit.

### TYPICAL FEED CAPACITY

- 3-4 cubic feet per hour, per square inch of grate surface.

### MAGNETIC TUBES

- Size is 1" dia. Standard spacing of tubes is 2" center to center. Nonstandard tube spacing also available.
- Single or multiple banks of tubes.
- Magnetic material: ceramic, rare earth, or combination of ceramic and rare earth banks. Rare earth available in different strength levels.
- Easy clean and auto clean models require rare earth.
- Magnetism is permanent and guaranteed for life.

### CLEANING

- Manual, easy clean, or automatic (pneumatic system).

### OTHER OPTIONS

- Transitions, deflectors, bin vibrator, and 55-gal. drum adaptor.

# Housed Grates and Transitions

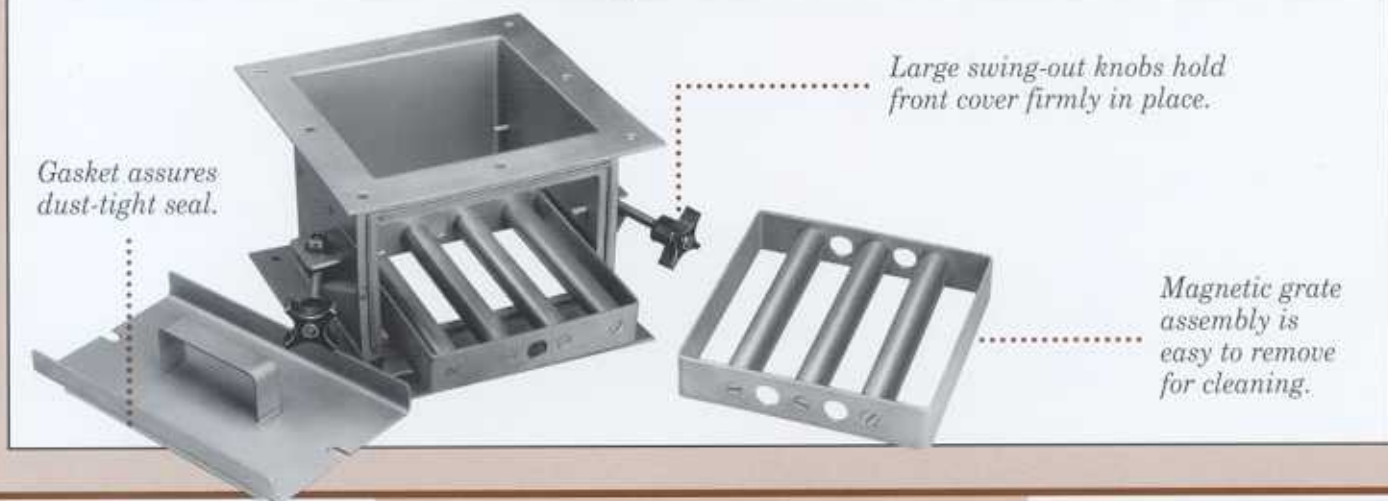


## HOUSED GRATES

A housed grate magnet is a welded enclosure with one or more banks of magnetic tubes inside. Drawer-type construction allows easy access to the inside, for removal and cleaning of the tubes. Top and bottom flanges allow the magnet to be bolted directly into a square or rectangular chute. Transitions are available for mating to any existing chute dimensions.

For applications requiring more convenient cleaning, an easy-clean model is recommended (see page 6).

A grate with a single bank of magnetic tubes and deflectors above it can be upgraded to a double bank grate at any time. The deflectors, held in place by flathead screws, can be replaced with magnetic tubes.



*Gasket assures dust-tight seal.*

*Large swing-out knobs hold front cover firmly in place.*

*Magnetic grate assembly is easy to remove for cleaning.*

## CUSTOM-MADE TRANSITIONS TO FIT YOUR SYSTEM

Dings grate magnets can be supplied with almost any type of transition you need to fit your pipe or chute. These adaptors make the transition from our square or rectangular grate openings to:

- Round pipes
- Smaller square or rectangular chutes
- Larger square or rectangular chutes
- Special flanges



*Typical transition to a round chute has a flat inlet panel with round flanged collar and a tapered outlet adaptor with round flanged collar. Flanges are drilled to your specifications. Other variations are available, such as tapered transitions on both ends, or both with flat panels and collars.*



# Options



## DEFLECTORS

In a grate magnet with a single bank of tubes, deflectors can be supplied to divert material directly against adjacent magnetic tubes. Deflectors for unhoused grates are made of stainless steel angles. For housed grates, a row of empty tubes (not filled with magnetic material) serve as deflectors. Each one is secured in position directly above the open space between magnet tubes.

Multiple bank grate magnets don't need deflectors. The banks are staggered, with one bank of tubes acting as a layer of deflectors for the next lower bank.

## SANITARY FINISH

Many food and pharmaceutical applications require sanitary finish on processing equipment.

Dings grate magnets can be supplied with optional sanitary finish in the product flow area.



## MAGNETIC TUBES ARE MANUFACTURED WITH THE HIGHEST GRADES OF CERAMIC AND RARE EARTH MATERIALS AVAILABLE

The major component in every grate magnet is the magnetic tube. It's 1" in diameter, made of stainless steel on the outside, and filled with rare earth or ceramic material inside. Often, grates are specified with a top bank of ceramic tubes and one or more banks below that of rare earth.

## CERAMIC VIII: SUPERIOR GRADE MAGNETIC MATERIAL

Dings Co. uses the best grade of ceramics for grate magnet tubes, ensuring a stronger, longer-lasting magnetic field. Ceramic VIII has a better resistance to demagnetization than Ceramic V or other lower grade materials.

This resistance is particularly important in grates because of the arrangement of polarities inside the tubes. For maximum separating power, the magnetic components must be assembled in the tubes with like poles facing each other. However, these repelling poles create a strong demagnetizing force which can weaken the performance of the grate magnet.

Ceramic VIII was developed specifically to overcome this negative effect making it the ideal material for grate magnets. Ceramic VIII also outperforms Ceramic V in applications involving high temperatures.

## RARE EARTH MAGNETS OFFER 16 TIMES MORE HOLDING FORCE

Powerful rare earth magnets are often specified for grate magnets. Rare earth material produces magnetism intense enough to separate particles that are very fine or only weakly magnetic. Some metal oxides and mineral contaminants are susceptible to only a very powerful and concentrated magnetic force. In the past, this would have required high intensity electromagnets that were large and expensive. Rare earth magnets provide relatively low cost separation of these difficult materials.

Our engineering staff is constantly investigating the newest type of rare earth material available, and specifies whatever is currently state-of-the-art for Dings grate magnets.

Compared to ceramic, Dings rare earth magnets have 4 times more pulling power and up to 16 times more holding force.

Rare earth magnets have dramatically more pulling and holding power. Both forces are important for separating weakly magnetic material. Pulling or attracting power is needed to make the separation; holding power prevents the nonmagnetic product flow from brushing off the attracted magnetic particles.



## DRUM ADAPTOR

The drum adaptor can be placed on top of 55-gallon drums. A drawer-type grate magnet inside the housing provides magnetic separation as the drum is filled. The adaptor is constructed of mild steel.

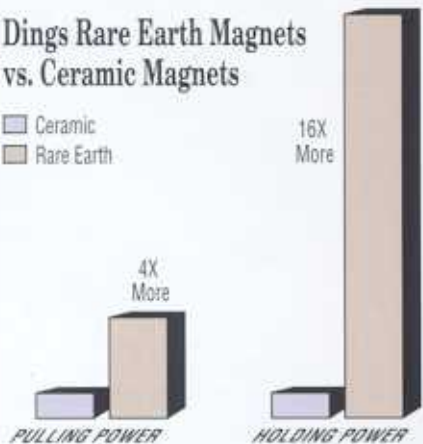


## BIN VIBRATOR

An optional pneumatic bin vibrator can be supplied on the back of the housing to prevent bridging of the material across the grate magnet. Another solution for fine cohesive materials is the motorized rotary magnet (see page 8).

## Dings Rare Earth Magnets vs. Ceramic Magnets

■ Ceramic  
■ Rare Earth

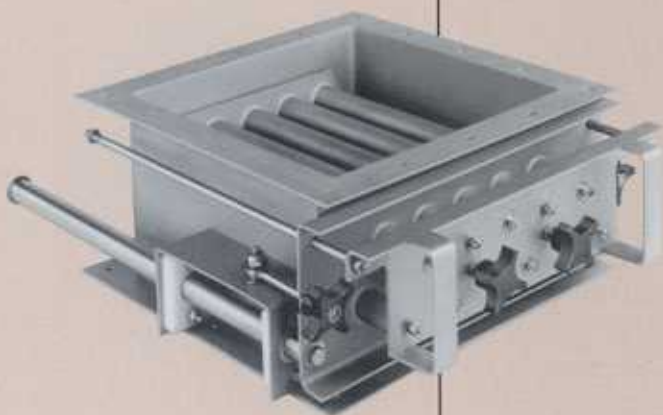


# Trouble-Free Cleaning



## EASY CLEAN GRATE

For applications which need more convenient or frequent cleaning, the housed grate magnet is available in an easy clean design. Specifications are the same as a standard housed magnet. The grate tubes are filled with powerful rare earth magnetic material.



## EASY CLEAN-OFF WITH A SIMPLE DRAWER PULL

The tube-within-a-tube drawer design allows for quick, convenient removal of ferrous contaminants, eliminating messy hand cleaning. The grate drawer contains one or more banks of tube-within-a-tube components. These have an internal assembly of magnetic tubes inserted into the outer cleaning tubes.

To clean, the drawer is slid forward, out of the product flow. The internal magnetic tubes are then pulled from the tube assembly, releasing the ferrous attracted to the surface of the outer tubes.

## NEW IMPROVED DESIGN...

A new gliding drawer design and heavy-duty hardware make the Dings Easy Clean Grate Magnet easier to operate and clean. Knobs and handles are larger for a better grip, and drawer supports strengthened for extra stability. All parts and hardware are attached, eliminating loose bolts or screws that can be dropped or lost. The drawer slides on sturdy support rods and UHMW guides for smooth, secure movement.

## SUPERIOR CLEANING METHOD

The patented tube-within-a-tube design will give years of trouble-free service since it doesn't use scrapers to clean the magnetic tubes. These plastic wipers deform and wear easily and must be replaced.

To clean the Dings magnet, the magnetic tubes are removed from the product flow area, eliminating any chance of debris jamming the tubes. Other tube-within-a-tube designs leave the inner magnetic tubes in the product flow area when cleaning and risk accumulating ferrous particles on the exposed tubes. Even with the product flow shut off, any small particles left in the chute will cling to the tubes, causing the outer tubes to jam when slid back in place.

*Patent No. 4,867,869*

## HOW IT WORKS

1



Ready-to-operate position: the face of the drawer assembly is secured against the housing.



# Features



## KEY DESIGN ELEMENTS

- Large swing-out knobs unlock the magnetic drawer so that it can be easily slid forward out of the product flow.
- Heavy-duty handles provide a firm grasp for removing the drawer or pulling out the inner magnetic tubes for cleaning.
- Large, easy-to-grip knobs on front of drawer release inner magnetic tubes from the outer tube assembly for cleaning.
- All four release knobs have brass inserts to prevent galling on stainless steel threaded hardware.
- A gasket on the drawer front assures a dust-tight seal.
- Magnetic drawer is supported by stainless steel rods, ensuring that drawer pulls out straight and evenly for proper opening and cleaning position. The support rods are held in place by low friction UHMW guide bushings for smooth opening and closing motion.
- Sturdy guide rods above prevent the drawer from being pulled all the way out, and replace chains or cables which can get caught or broken.
- Open design allows unrestricted product flow – no areas for product to get trapped.



To clean the magnet, loosen swing-away locking knobs on each side. Pull drawer all the way forward, out of the product flow. (Photo shows drawer pulled partially out.)



Loosen release knobs and pull internal magnetic tubes forward. This will cause the ferrous contaminants to drop from the surface of the outer cleaning tubes, since they're no longer held there by a magnetic field.

## Special Applications



### AUTO CLEAN

Product in a vertical chute flows through self-cleaning magnetic tubes on right side of Auto Grate. Top plates cover piston operating section and ferrous discharge area. For more information, see Bulletin 1215.



### ROTARY

Rotary grate has magnetic tubes in a circular arrangement held in place by two stainless steel end plates. For more information, see Bulletin 1211.



### AUTO CLEAN

A pneumatic system cleans the rare earth magnetic tubes automatically, at regular intervals controlled by a timer. The Auto Grate is ideal for inaccessible locations where manual cleaning is difficult, for applications where ferrous content in product flow is very high, or for applications where manual cleaning by personnel may be unreliable.

For continuous magnetic protection, or applications where the product flow cannot be shut off while cleaning, two auto grates can be mounted in position, providing continuous magnetic protection. (While one unit is in the cleaning mode, the other is operational.)

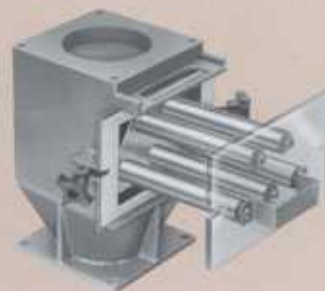
### HOPPER

Designed for the plastics industry, the hopper magnet protects molding machinery and other processing equipment from damaging ferrous metal. Separation can be conveniently monitored through the transparent drawer face. Slide gate shuts off product flow and is provided as a standard feature. Options include: easy clean design, rare earth magnets, 304 stainless steel housing, purge hopper, liquid dispensing port, and discharge dump tube.

### ROTARY

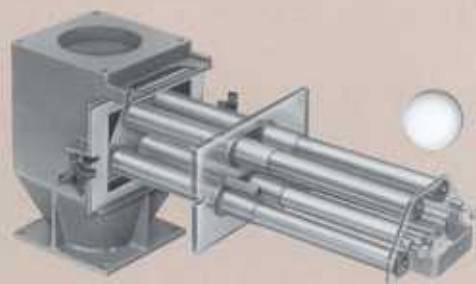
This motorized separator is ideal for materials that do not flow easily and tend to plug up standard grate magnets.

Rotary grates are recommended for pulverized minerals and ceramics, fibrous substances, and fine cohesive materials such as magnesium oxide, zircon powder, fly ash, alumina, gypsum, lime, powdered sugar, cornstarch, and flour. The rotary action not only prevents material from bridging, but it improves magnetic separation by agitating cohesive powders. It's available in ceramic or rare earth.



### HOPPER

Hopper magnet is shown with magnetic tube drawer pulled outward for cleaning. For more information, see Bulletin 1218.



### EASY CLEAN HOPPER

Patented tube-within-a-tube cleaning system eliminates messy hand cleaning.

 **Dings**  
CO  
**magnetic group**

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### PROVIDING SEPARATION SOLUTIONS SINCE 1899

Other Dings magnetic separators for free-flowing powders and granular materials include plate magnets for sloping chutes; Perma Chutes, magnetic humps, and self-cleaning drums for vertical chutes; and in-line magnets for pneumatic lines. Our sales engineers and local representatives can help you select and size a Dings magnet to your exact requirements.

*Dings grate magnets are at work in a variety of industries: chemicals, pharmaceuticals, cosmetics, paint and coatings, glass, ceramics, plastics, food, grain, fertilizer, sand, clay, and minerals.*