

**Ceramics**

# About BUNTING

Bunting is an industry leader in the design, manufacture, and sales of cutting-edge magnetic equipment used in applications such as magnetic separation, metal detection, conveyor systems, custom manufactured magnets, and more. All of the products we sell are custom-designed by our engineering team. We work with customers to determine their exact needs and develop a product that will perfectly suit the challenges of the industry they are working in and the materials they are handling, as well as being designed to fit within the existing layout of the customer's facility.

Since 1959, Bunting has been a family-owned, family-operated company. Headquartered in Newton, KS, Bunting currently has multiple branches within the United States as well as abroad in the United Kingdom. We are committed to upholding the all-American values of innovation, dedication, and hard work that Bunting was founded upon sixty years ago.

As technology continues to advance across every industry, Bunting remains committed to integrating new technology into our products, creating solutions that address modern industry challenges, and continuing to expand our domestic and international reach.

**Bunting-Newton** primarily focuses on magnetic equipment for magnetic separation and metal detection applications. Newton, Kansas has served as the company's headquarters since 1979. Here, we design and manufacture magnetic separation, metal detection and material handling equipment as well as a complete line of printing cylinders. With a team of engineers using world-class, computer-aided design equipment, we can customize and develop products to fit any application or production line.

**Bunting-DuBois** has a unique role as it is the only North American manufacturer of compression bonded, injection molded, and hybrid magnets used in custom designed permanent magnet assemblies. These assemblies are used in the military, aerospace, automotive, and other industrial commercial industries.

**Bunting-Elk Grove Village** is home to the company's Magnet Materials division. Bunting-Elk Grove Village provides the largest online selection of permanent magnets and magnetic equipment, with all in-stock items able to be shipped within 24 hours of an order being placed on its website, [BuyMagnets.com](http://BuyMagnets.com).

**Bunting-Berkhamsted** provides total magnetic solutions—from individual magnets and magnetic sub-assemblies to magnetic separation, material handling, and metal detection equipment to various industries throughout Europe and the UK. Bunting-Berkhamsted also manages [E-magnets.com](http://E-magnets.com), where customers may purchase a wide variety of commonly used magnets.

**Bunting-Redditch** provides a complete line of magnetic separation, recycling, and metal detection equipment to industries across the globe through a worldwide network of distributors.



# BUNTING®

## Magnetic Technology for All Industries

The unique benefits of magnetic technology can be utilized across a wide range of applications, and Bunting is always looking to the future regarding new challenges that present themselves in the many industries we work with. Bunting engineers are constantly working to develop new technologies and improve upon our existing product lines. Bunting custom designs, manufactures, and distributes a broad selection of magnetic separation and metal detectors for the following general sectors:

**FOOD AND PHARMACEUTICALS**

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**PLASTICS**

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**RECYCLING**

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**AUTO SHREDDING**

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**AGGREGATE, MINING, AND MINERALS**

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**CERAMICS**

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**TEXTILES**

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**METAL STAMPING & FABRICATING**

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**PRINTING, DECORATING AND CONVERTING**

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**CUSTOM MAGNETS AND MAGNETIC ASSEMBLIES**

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**STOCK MAGNETS & MAGNETIC TOOLS**

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Across all the industries Bunting works with, our commitment to providing quality products and customer service remains consistent. Bunting enthusiastically offers custom designed applications for customers bringing unique challenges to the table, and we take pride in working individually with each customer in order to provide the best product possible.



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## PERMANENT MAGNETS

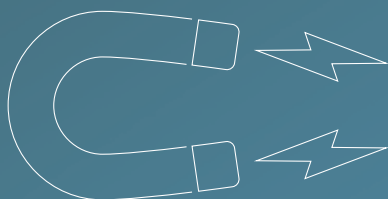
Permanent magnets are essential to virtually every piece of magnetic industry technology, which makes consistent magnet quality essential. Bunting entered the magnetics industry in 1959 as a magnet distributor and rapidly grew to a manufacturer of magnetic products, focused on custom design and customer-focused engineering. Today, Bunting is a leader in manufacturing and designing a diverse range of innovative magnetic technologies across industry sectors. Listed below are the general permanent magnet types that are used in Bunting products.

### CERAMIC

Ceramic magnets, or ferrite magnets, are low cost, lightweight, and relatively high-energy permanent magnets capable of withstanding operating temperatures of up to 480°F. These qualities make them a popular choice in manufacturing and consumer applications such as speaker magnets, DC motors, reed switches, sweepers, MRIs, and automotive sensors.

### CERAMIC GRADES 5 AND 8

The most popular grades of ceramic magnet are 5 and 8. These are anisotropic grades, which are considered the most powerful. Anisotropic magnets experience magnetization exclusively in the direction they were pressed towards when they were made, resulting in a magnet with an overall higher adhesive force.



## NEODYMIUM MAGNETS

Neodymium magnets are a member of the rare earth magnet family and are the most permanent magnets in the world. They are composed of Neodymium (Nd), Iron (Fe) and Boron (B), causing these magnets to be vulnerable to rust if they are exposed to the elements. To protect the magnet from corrosion and to strengthen the brittle magnet material, the magnet is usually coated with nickel. Other coating options are zinc, tin, copper, epoxy, silver and gold.

Extremely strong and affordable, neodymium magnets are commonly used in consumer products such as cell phones, loudspeakers, fasteners and toys. Industrially, they're used in metal detectors, oil filters, alternators, flow meters and as clamps by welders. MRI machines, hybrid and electric vehicles, and wind turbines all employ neodymium magnets.

### HIGH TEMPERATURES AND NEODYMIUM MAGNETS

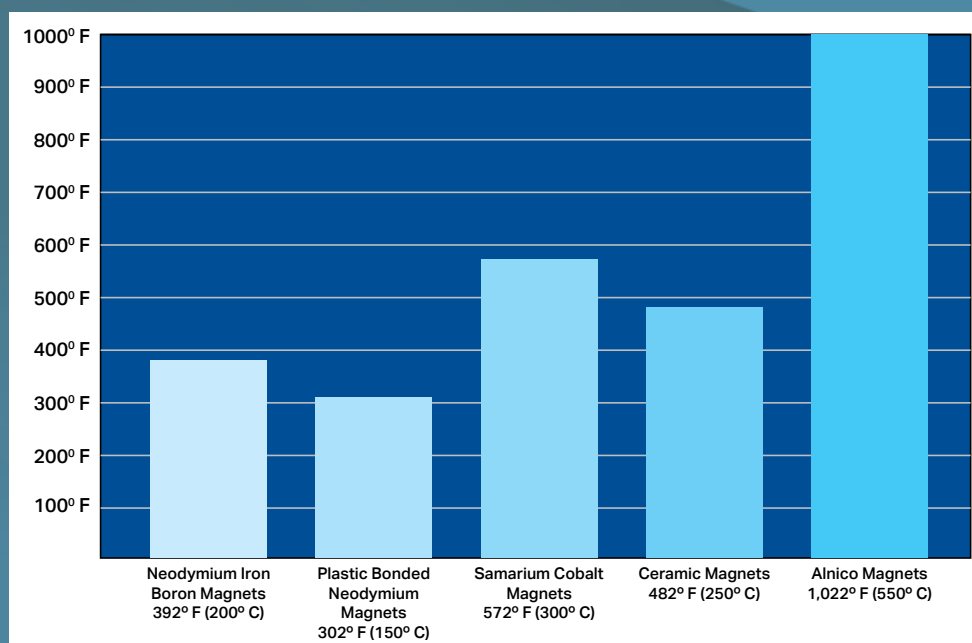
Like other rare earth magnets, neodymium magnets have a high resistance to demagnetization. They will not lose their magnetization if dropped or exposed to other magnets. However, neodymium magnets will completely lose their magnetization if heated above their Curie temperature, which is 590°F (310°C) for standard N grades.

Neodymium magnets are available for standard temperature and high-temperature applications. Standard temperature neodymium magnets will begin to lose strength if they are heated above their maximum operating temperature, which is 180°F (80°C). High-temperature neodymium magnets can safely be used at operating temperatures up to 300° Fahrenheit (149° Celsius).

## SAFETY AND NEODYMIUM MAGNETS

Neodymium magnets must be handled with care to avoid injury and damage to you and the magnet. Keep the following things in mind when handling neodymium magnets:

- Fingers and hands can get severely pinched between two attracting magnets. It is important that they be kept out of the reach of small children.
- Neodymium magnets are brittle and can peel, crack or shatter if allowed to slam together.
- Eye protection should be worn.
- Neodymium magnets can also damage items such as credit cards, magnetic identification cards, or video tapes.
- Never place neodymium magnets near electronic devices. It is crucial to never allow them near a person with a pacemaker or similar medical aid.
- Neodymium magnets should not be machined. The material is brittle and prone to chipping and cracking, so it does not machine well by conventional methods. Machining the magnets will generate heat, which if not carefully controlled, can demagnetize the magnet or even ignite the material, which is toxic when burned.





## QUALITY AND PURITY FOR CERAMICS

At Bunting, we are highly conscious of the fact that customers depend on our equipment to ensure the quality of their ceramics products. We pride ourselves on working closely with customers to develop custom equipment that fits their needs perfectly. This allows our product to integrate seamlessly with the existing components of the production environment, as well as providing the best suited equipment for handling the material the customer is working with.

Since 1959, Bunting has been a family-owned and family-operated business. Many things about our lifestyles have changed since 1959,

but Bunting's dedication to customer service and ensuring the quality of ceramics with our magnetic technology has not changed in the slightest, and neither has the value of a high-quality ceramic item such as a classic dinnerware set or bathroom sanitaryware. From the past to the present, Bunting has worked tirelessly throughout the decades to create innovative magnetic technology and custom-designed magnetic solutions focused on improving safety, quality, and purity. We look forward to partnering with you and working together to develop equipment that will help you operate at the highest possible standards for product integrity.

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## MAGNETIC SEPARATION & METAL DETECTION FOR THE CERAMICS INDUSTRY

Bunting provides equipment to help companies working in the ceramics industries by using magnetic separation technology to remove para and ferro magnetic particles, including free fine iron, from ceramic raw materials, slips and glazes. All our equipment is designed to be low-maintenance and operator friendly to increase efficiency and improve product quality whilst reducing reject rates.

Magnetic separation utilizes powerful permanent magnets and electromagnets to pull out coarse and fine para and ferro magnetic particles from ceramic raw materials, slips and glazes. The strength and configuration of both permanent and electro magnetic fields enable the capture of even the finest magnetic

particles, ensuring that the finished ceramic has a bright and blemish-free finish. Bunting offers magnetic separation equipment suitable for the complete ceramics manufacturing process, from receipt of raw materials through to the application of the glaze.

All our products are custom designed according to the customer's specifications, allowing for them to integrate seamlessly into the existing production environment. Our team of engineers works with each customer to deliver a personalized piece of equipment with the physical dimensions to best fit your space and the magnetic components that best suit your separation, detection, and conveying needs.

# TYPES OF MAGNETS

The attractive force of a magnetic separator is either generated from a permanent magnet or from an electromagnetic coil. Permanent magnets feature in the vast majority of magnetic separation technology, which makes consistent magnet quality essential. Bunting entered the magnetism industry in 1959 as a magnet distributor and rapidly grew to a manufacturer of magnetic products, focused on custom design and customer-focused engineering. Today, Bunting is a leader in manufacturing and designing a diverse range of innovative magnetic technologies across industry sectors. Listed below are the general permanent magnet types that are used in Bunting products supplied to the ceramics

## CERAMIC MAGNETS

Ceramic magnets, or ferrite magnets, are low cost, lightweight, and relatively high-energy permanent magnets capable of withstanding operating temperatures of up to 480°F. Ferrite magnets produce deep magnetic fields, which are ideal for magnetic separators suspended over conveyors or mounted in chutes to separate larger tramp metal such as nuts and bolts.

## NEODYMIUM MAGNETS

Neodymium magnets are a member of the rare earth magnet family and are the most permanent magnets in the world. In the form of slugs, blocks and rings, Neodymium magnets are used in a wide range of high-intensity magnetic separators to attract, hold and separate fine iron and weakly magnetic particles.

## ELECTROMAGNETS

Electromagnets generate a magnetic field through either a copper or aluminum wire coil. The coil design dictates the shape and strength of the magnetic field to suit a specific application. In the ceramic sector, electromagnets are used to cleanse raw materials of tramp metal and, more importantly, to remove fine iron as well as para and weakly magnetic minerals from slips, bodies and glazes.





# MAGNETIC CARTRIDGES AND GRATE MAGNETS FOR PURIFYING DRY AND WET CERAMIC MATERIALS

## MAGNETIC CARTRIDGES

Thanks to computer-aided design, Bunting cartridges achieve the optimum balance between magnetic reach-out and holding force. Cartridges can be mounted individually, side-by-side or in multiple-row arrays. Bunting offers ceramic, neodymium Power-Balanced™ rare earth, neodymium high-intensity rare earth, and neodymium high-intensity rare earth temperature-compensated magnets.

## GENERAL-PURPOSE MAGNETIC CARTRIDGES

Both standard and heavy-duty models are constructed of durable 304 stainless steel tubing and are available with threaded hole, threaded rod, or plain sealed end plugs. 316 stainless steel is also available. End plugs are fully welded into the tough 1-inch diameter tubing for added durability.

- Select tapped, sealed or studded ends.
- Standard 1" round cartridges start at 4" lengths.



## HEAVY-DUTY MAGNETIC CARTRIDGES

Bunting heavy-duty cartridges are designed for maximum metal removal.

For use where high flow rates or bridging might be a problem, or where structurally stronger cartridges are required. These 1 1/2" square cartridges offer superior reach-out and nearly twice the magnetic surface area of standard 1" cylindrical cartridges.

- Durable, heavier-gauge stainless steel tubing resists wear and lasts longer in demanding applications.
- High-intensity rare earth magnets are standard.
- Heavy-duty 1 1/2" square cartridges offer nearly two times the magnetic surface area of standard cartridges.

## NUHI™ NEO ULTRA HIGH INTENSITY MAGNETIC CARTRIDGES

Completely redesigned from the ground up to address the processing challenges manufacturers face, the NUHI™ cartridge means more power, a purer product, and better plant efficiency.

- Over 105 oz of Pull Strength.
- 316 Stainless Steel Construction to ensure durability.
- 14% stronger than our previous cartridge design.



# PURIFYING DRY MINERALS AND CERAMIC POWDERS

## GRATE MAGNETS

Bunting grate magnets remove ferrous metal fragments, and larger metal objects various products. Grates can be installed or simply laid inside hoppers, chutes, housings and bins, where they can be accessed for cleaning.

## GENERAL-PURPOSE GRATE MAGNETS CARTRIDGES

- Standard grate magnets use 1" round cartridges. They are easy to access and remove for cleaning.
- Available in round, square, and rectangular arrays. Standard sizes from 4" to 36". Easily fit into a variety of applications.
- 304 Stainless Steel is standard but 316 Stainless Steel is available for corrosive environments.



## HEAVY-DUTY GRATE MAGNETS

- 1 1/2" square tubing made from sturdy 304 Stainless Steel welded to frame with rigid channel side members.
- Available in square and rectangular styles. Standard sizes range from 12" to 60" on a side to fit in a variety of applications.
- Ruggedly built for demanding indoor/outdoor use.
- Ideal for handling abrasive products and hard-to-flow materials and, minimizing bridging and product build-up.



## ADDITIONAL GRATE MAGNETS

Plain Style

Angular baffles

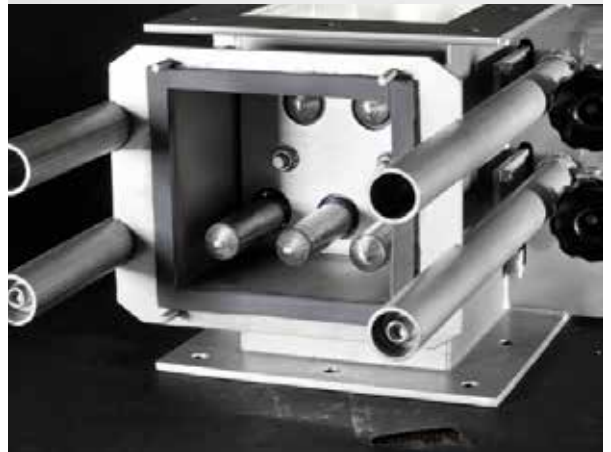
Rod baffles



## HF DRAWER MAGNETS

Bunting® HF Series Drawer Magnets are equipped with powerful magnetic cartridges to handle a wide range of separation tasks in mechanical or gravity flow applications. They can be configured with up to 5 cartridge trays, arranged so that the cartridges are staggered to increase contact with the product stream. Material moves in a waterfall flow pattern from one cartridge tray to the next, resulting in exceptionally thorough cleaning.

- Bunting supplies custom transitions to match round, square, or rectangular spouting.
- Multiple trays provide increased contact with product flow for more complete metal capture.
- HF Drawer Magnets are available with the NUHI™ Neo Ultra High Intensity Cartridge Magnet. Completely redesigned from the ground up to address the processing challenges manufacturers face, the NUHI™ cartridge is nearly 20% stronger and delivers 50% more reach out than our previous cartridge design. Ceramic and rare earth magnets are also available.
- Manual standard, manual self-cleaning, pneumatic self-cleaning, and pneumatic continuous self-cleaning configuration options are available.



## HF DRAWER CONFIGURATION OPTIONS

### MANUAL STANDARD

In the manual standard configuration, ferrous debris is removed from the cartridges by sliding the trays out of the housing and wiping them off by hand. This allows for the operator to see exactly how much material was separated out of the product line, giving them insight into the process and providing hands-on interaction.



### SELF-CLEANING

The self-cleaning configuration is designed to fully extend the magnetic cartridges outside the housing. As these tube assemblies travel outside the housing, the ferrous metal is wiped from the surface of the cartridge. The collected metal then drops off into a tray outside the housing.



### PNEUMATIC SELF-CLEANING

The pneumatic self-cleaning configuration releases ferrous contaminants into the discharge area automatically using pneumatic power. With this model, product flow must be stopped in order to clean cartridges and prevent contaminated products from flowing into product stream. Pneumatic units operate via a toggle control, push button or timer. They can also operate via a Bunting engineered automated control package, making them an ideal choice for installing in hard-to-reach locations.



### PNEUMATIC CONTINUOUS SELF-CLEANING

The pneumatic continuous self-cleaning configuration utilizes a special drawer design that allows product to continuously flow while magnets are being cleaned. There is no need for a gate to stop product flow. Each row of magnets is cleaned in an alternating pattern, allowing the product to remain in contact with a row of magnets at all times. This unit operates by remote switch or by a Bunting-engineered automated control package, allowing it to be installed in hard-to-reach locations.



# PLATE MAGNET

Bunting® supplies various types of plate-based magnetic separators that can be implemented into a broad range of applications, and can be used with an equally wide range of materials. Bunting's Plate Magnets are designed for the capture of tramp metal in conveyed materials and gravity free-fall applications.

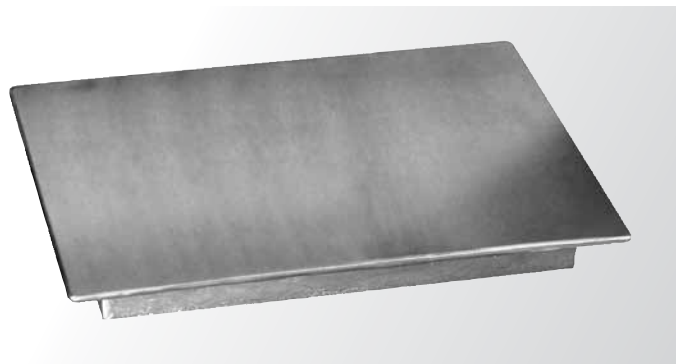
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## STANDARD PLATE MAGNET

Bunting Standard Plate Magnets are available with permanent ceramic magnets or with high-intensity permanent rare earth magnets. Both types of magnets work efficiently to capture fine metal particles and slightly magnetic debris from powdery, moist, clumpy, or abrasive materials that might choke or wear cartridge-based separators. Plate magnets install easily in chutes to remove ferrous fine particles and larger pieces of tramp iron from many types of free-flowing and pneumatically conveyed material. They can also be installed above conveyors or below conveyor drive pulleys to capture contaminants as material drops from open belts. Standard installation kits include a pre-drilled hinge, latch, and other hardware to ensure easy mounting. The tapered magnetic face is designed to prevent contaminant wipe-off in rapid product flow. Standard plate magnets are available in widths from 4" to 60".

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- Ideal for 30° to 60° inclines, allowing contaminants to be trapped as material flows over the plate magnets.
- Hinged plates swing out for easy cleaning.
- 300 series SS construction. 316 stainless steel available when required. Tapered step face to prevent product wipe off in rapid product flow is standard with 400 stainless steel.
- Rare earth magnets are available to provide maximum strength and reach out.
- Optional replaceable grain face available for dealing with abrasive materials.



## SUSPENDED PLATE MAGNET

Bunting suspended plate magnets are designed to be suspended above open conveyors to remove ferrous objects and fines found in conveyed materials such as ceramic raw materials and spray dried ceramics.

- Suspends over conveyor belt or drop off point to remove ferrous contaminants without interrupting product flow.
- Powerful ceramic magnet field reaches deep into conveyed material to pull ferrous tramp from flat-belt and trough style conveyers. Rare earth magnet models are available for applications that require greater magnetic power.
- Sturdy, free-standing, bolt-together support frame offers a convenient mounting option.
- Optional stripper plate slides out for fast, easy, out-of-the-way cleaning.



Our Suspended Plates come in sizes matched to common belt widths and are outfitted with eye-bolts to aid in handling and overhead suspension.

- 950 Suspended Plates are designed for deep 10" reachout troughing applications and for high conveyor speeds of 100 to 300 fpm.
- 650 Suspended Plates are designed for medium-duty and lighter burden depth where 6 1/2" reachout is adequate. The 650 Series is a cost effective choice when dealing with lighter product density, lower conveyor speeds, or thinner burden depths.
- 450 Suspended Plates are designed for light-duty flat belt applications with a 6 1/2" reachout. They can be upgraded from ceramic to rare earth magnets, resulting in higher intensity magnetic fields to separate metal fines from thin, light layers of products conveyed at speeds under 100 fpm on flat belts.





## OVERBAND MAGNET

Bunting's Overband and Suspension Magnets work in front of Metal Detectors to remove all larger tramp iron and prevent damage to storage silos, crushers, conveyors and ball mills. Overband and Suspension Magnets sit above conveyors to separate tramp ferrous metal and are available in permanent and electromagnetic versions.

Overband Magnets include a self-cleaning, continuously running belt assembly to automatically move captured metal into a separate collection area. This design is ideally suited for applications with high levels of tramp metal contamination. Suspension Magnets feature only the magnet block for applications where the level of tramp metal contamination is especially low.



- Different magnetic configurations to suit a range of applications;
- Designs for both Crossbelt or Inline installations;



## METAL DETECTOR

Bunting's TN77 Industrial Metal Detector detects damaging tramp metal present in conveyed ceramic raw materials. This includes identifying both tramp iron and manganese steel (e.g. digger teeth). Once detected, the problematic metal is removed either manually or automatically, preventing damage to storage silos, crushers, conveyors and ball mills. The TN77 design is easy to install and simple to operate, making it one of Bunting's most popular metal detectors.

- Easily installed;
- Adjustable levels of sensitivity and detection.
- Detects all tramp metal such as tramp iron and manganese steel.
- Able to indicate if 1 or 2 pieces of tramp metal are detected.
- Operated via a separate mounted control.



# DRUM MAGNET

Bunting manufactures a wide range of permanent Drum Magnet separators, for fine iron separation. The magnetic drum separator is normally installed at product discharge points and incorporates a 150 – 180 degree magnet system, encased in a stainless-steel shell,. The Drum Magnet pulls iron contamination out and behind the clean product path and discharges it automatically while the clean product continues its normal trajectory. Drum magnets are self-cleaning and provide continuous separation of ferrous contaminants from a wide range of free-flowing bulk and granular materials in high-volume applications.

## STANDARD DRUM MAGNET

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- Allow continuous separation and cleaning without interruption to the product flow.
- Ideal for high-flow, heavy-contamination applications.
- Optional manganese wear plates for abrasive materials.
- Multiple drums can be used sequentially for heavily contaminated product.
- Direct drive with an optional variable speed control based on your application needs.
- Open style design (free of housing) is ideal for installing at the end of conveying machines, such as chutes, for removal of ferrous contaminants.
- Totally enclosed design (equipped with housing) is ideal for applications where product must be kept free from external contamination, as well as protecting your employees from inhaling any dust being given off from the product.



## RARE EARTH DRUM MAGNET

Constructed with a core of Neodymium Iron Boron, Rare Earth Drums are ideal where extremely high magnetic intensities are required on the face of the drums.

- Suitable for the removal of fine ferromagnetic and paramagnetic particles from raw materials and spray dried ceramic powders.
- Can be fitted into totally closed housings where product must be kept free from external contamination.
- Drums can also be supplied with optional vibratory feeders to ensure an even spread of material is presented to the drum surface.



## WIRE WRAPPED DRUM MAGNET

Constructed in the same way as a standard Rare Earth Drum Separator, the Wire Wrap High Intensity Drum Magnet utilizes a Neodymium Iron Boron magnet system, however, the outer drum cover features wire wrapping that intensifies the magnetic field to separate weakly and para magnetic minerals.



## PULLEY MAGNET

Offering superior continuous removal and discharging of ferrous contamination, such as bolts and from conveyors, all with maintenance-free operation. OEM Separation Pulleys are economical magnetic separation pulleys that can be used to transform your standard material handling conveyor into a material separation conveyor. Being able to combine the transport of your materials and the separation of contaminants into one simple step increases the efficiency of your operation

- Manufactured for maximum reach-out, holding force and separation effectiveness.
- Available in ceramic and neodymium rare earth magnets for maximum separation.
- Pulleys are 4" to 48" in diameter depending on your application needs.
- Widths from 4" up to 84" wide
- Available in 4", 6", 8", 10", 12", 15", 18", 24" and 30" diameters and in widths from 4" up to 84" wide.



- Pulleys are offered with economical stepped crowned face, machine crowned face, flat faced and provide an assortment of rubber vulcanized crowned covers. These pulleys can be provided with the same shaft your existing conveyor has, making the switch from a standard to a magnetic pulley system quick and easy.
- We offer an assortment of taper lock or QD hubs for any shaft diameter you need or welded in shafts to slip into the end of your conveyor and match up perfectly.

## HIGH INTENSITY SEPARATION PULLEY

Built with high-intensity neodymium rare earth magnets, these pulleys are designed for the toughest jobs that require maximum separation. High-intensity separation pulleys are ideal for separating materials that are difficult to magnetically attract and separate from a material flow using standard methods, such as paramagnetic fine particles, stainless steel scrap, and work-hardened fasteners.

- Deep reach rare earth field pulleys are ideal for installation in high volume processing lines to ensure all ferrous metals are removed from deeper burden streams before they reach other equipment.
- Pulley units can be incorporated on OEM conveyors, providing reach outs of 10" to 12" with unmatched field intensity.
- Low reachout rare earth field pulleys are available, designed to have high gauss, super high-intensity fields while maintaining a low reachout in order to suit low volume applications.



- Low reachout pulley units can be easily incorporated on OEM conveyors to create an all-in-one system for conveying and separating materials.
- Electro Pulleys available with variable flux control for selective separation of materials with different magnetic properties.

## PNEUMATIC IN-LINE MAGNET (PIM)

Pneumatic in-line magnets are built for use in dilute phase pneumatic conveying systems. They can be installed easily with optional factory-supplied compression couplings and, work best in horizontal runs with the plate magnet down to take advantage of material stratification. Pneumatic in-line magnets feature full-flow architecture to allow an unobstructed product stream.

- Designed for unobstructed product flow in dilute phase conveying up to 15 psi.
- Best suited for horizontal installation.
- Portable carts are available.
- Compression couplings speed in-line installation.
- Rare earth tapered step plate magnets are standard.
- Tapered transitions guide material directly over the face of the hinged plate magnet, which swings away from the housing for quick external cleaning.



## CENTER-FLOW IN-LINE MAGNET (CFM)

Center-flow in-line magnetic separators are engineered to remove ferrous fine particles and larger pieces of tramp iron from dry particulates as they travel through dilute-phase pneumatic conveying lines. To achieve optimum contact with the product flow, a conical magnet is suspended in the center-line of the housing. This tapered, exposed-pole cartridge has a stainless steel "nose cone" to direct the flow of materials around the magnet. The magnet's tapered poles allow ferrous fine particles to collect out of the direct air stream. Additionally, the trailing end of the magnet is an active pole which will collect any tramp metal that gets swept down the cartridge.

- Designed for unobstructed product flow in dilute phase conveying up to 15 psi.
- Available with all line and fitting types. Placement in vertical run makes optimum use of the magnetic field and ensures maximum efficiency in separation.
- Rare earth magnets are standard.
- Optional clear view inspection port to observe separation process.
- Comes standard with a tapered step face to prevent product wipe off.
- 3" and 4" models are manufactured using new bolt-on flange design for quick delivery.



## GRAVITY IN-LINE MAGNET (GIM)

Bunting® Gravity In-Line Magnets allow you to utilize our powerful plate magnets in round, sloping spouting where material is under gravity flow. For effective tramp capture, spouting should be angled no more than 60° from horizontal.

- Tapered step magnet. Effective for capturing material under gravity flow in round, sloping spouting.
- Built to fit most gravity flow line sizes.



## INDUCED ROLL SEPARATOR

The Induced Magnetic Roll Separator (IMR) uses an electromagnet to generate high-intensity magnetic fields. These magnetic fields enable the separation of weakly and para magnetic minerals (e.g. mica, iron-coated silica, etc) from non-metallic minerals (e.g. feldspar, silica sand, zircon, etc) in a dry state. Once cleansed, the non-metallic minerals are used in many industries including the production of ceramics and glass.

The IMR is widely regarded as one of the most robust and versatile dry high-intensity magnetic separators.

The IMR offers many advantages compared with permanent magnetic separators including:

- Adjustable features including:
  - Magnetic field strength, by varying the power to the electromagnetic coils.
  - Roll speed for retention time of the mineral in the magnetic field.
  - Gap between the induced roll and pole to accommodate different feed size ranges.
- Ability to process hot mineral feeds (up to between 80° and 100°C)
- Generates limited static charge that may affect the separation performance.
- Robust design that requires limited maintenance and spare parts.



## RARE EARTH ROLL SEPARATOR

The Rare Earth Roll Separator (RE Roll) is one of the world's highest-intensity, permanent magnetic separators used to purify dry non-metallic minerals (including feldspar, silica sand, zircon, etc) and spray dried ceramics. The RE Roll removes ferro, para and weakly magnetic minerals from non-magnetic product material.

The Rare Earth Roll Magnetic Separator (RE Roll) is a two-pulley conveyor system with the head pulley constructed out of alternating rings of Neodymium Iron Boron (NdFeB) Rare Earth Magnets and steel pole pieces.

The ultra-strong magnetic head roll of the RE Roll enables the separation of ferro, para and weakly magnetic minerals such as muscovite and mica.



- 200mm diameter high-intensity rare earth magnetic roll.
- Suitable for materials with a particle size between 75 micron and 15mm;
- Operating widths up to 1000mm.
- Commonly supplied with a Vibratory Feeder for controlled and even feed.
- Variable belt speeds for specific application adjustment.

## PURIFYING CERAMIC SLIPS, BODIES AND GLAZES

### LIQUID PIPELINE SEPARATORS AND MAGNETIC LIQUID TRAP

Liquid Pipeline Separators and Magnetic Liquid Traps are designed to remove ferrous tramp metal contamination from liquid and slurries transported in pipeline. To provide continuous and dependable magnetic protection in non-fibrous fluids, the design of this trap forces liquids through a tightly spaced grid of magnetic cartridges, ensuring close contact between the product and the magnetic field. They provide dependable protection against tramp iron contamination and come equipped with powerful high-energy and high-temperature neodymium magnets to capture fine iron and magnetic minerals.

### PIPELINE TRAP SEPARATOR

- Incorporating a series of high intensity rare earth tubes, the unit is installed into existing pipelines as an effective means of magnetic protection.
- Manufactured from stainless steel complete with flanges or threaded ends.
- Available with water jacket for temperature regulation.





## CARTRIDGE STYLE MAGNETIC LIQUID TRAP

Cartridge Style Magnetic Liquid Traps are designed to remove ferrous metal contamination from liquid processing and conveying lines. To provide continuous and dependable magnetic protection in non-fibrous fluids, the design of this trap forces liquids through a tightly spaced grid of magnetic cartridges, ensuring close contact between the product and the magnetic field.

- Easily spot check the magnetic cartridge for contamination with unique Clean in Place (CIP) design.
- Equipped with standard high-temperature and high-intensity rare earth magnets, allowing for a powerful magnetic field that will not be compromised by heat.
- All fittings are available. Standard 2", 3", and 4" line diameter. Half inch diameter and other sizes are available upon request to best fit your operating dimensions.
- Special T-Trap design for 5" and above line sizes.



## PLATE STYLE MAGNETIC LIQUID TRAP

Single-plate magnet and dual-plate magnet liquid traps effectively remove ferrous particles from viscous and fibrous liquids, as well as from liquids containing larger suspended solids. These traps are designed to direct contaminants against a magnetic plate and into a deep magnetic field where they are captured and protected from the wiping action of the liquid flow. A deflector creates gradual change in the direction of flow to agitate the product, and expose contaminants that would otherwise be blocked by suspended solids.

- Equipped with standard high-temperature and high-intensity rare earth magnets, allowing for a powerful magnetic field that will not be compromised by heat.
- All fittings are available. Our standard model offers 1"-4" inlet with 1/2" sizes, and special sizes are available upon request to best fit your operating dimensions.
- Special T-Trap design for 5" and above line sizes.



## ELECTRO MAGNETIC FILTERS

The Electro Magnetic Filter produces a high-intensity magnetic field (up to 40,000 Gauss) to separate fine iron and paramagnetic minerals from liquids and slurries. The technology is widely used in the ceramics industry to remove problematic magnetic particles from slips and glazes. In the Mineral Processing industry, more powerful Electro Magnetic Filters can remove fine grinding iron and some paramagnetic minerals (e.g. Hematite) found in non-metallic minerals slurries.

The Electro Magnetic Filter provides one of the most effective methods of continually removing problematic fine iron and paramagnetic minerals from ceramic slips and glazes, as well as industrial mineral slurries (e.g. Kaolin, Calcium Carbonate). The technology produces a higher separation efficiency than permanent magnetic separators such as Liquid Pipeline Separators and Tube Magnet configurations by generating significant background magnetic field strength in the canister (2,500 Gauss, 5,000 Gauss or 10,000 Gauss) and high magnetic field gradient on the matrix surface. The enhancement of the magnetic field on the matrix surface is 4 times the background field – e.g. a 10,000 Gauss background field will generate 40,000 Gauss on the matrix.

Electro Magnetic Filters consist of an electro magnetic coil positioned around a central hollow core containing a magnetic (400 series) stainless-steel matrix of various designs. The highly-efficient computer designed coil generates a high intensity magnetic field that becomes intensified on the points of the matrix creating the magnetic force needed to separate paramagnetic particles from the slurry.

The magnetic coil is either enclosed in a circular or rectangular steel casing designed to intensify the magnetic field into the hollow centre of the coil. Valves trees (for the product feed and exit as well as cleaning water and air) are mounted on the top and bottom to suit the application and installation.

Removal of the captured magnetics inside an Electro Magnetic Filter is either undertaken manually or automatically. For automatic operations, the process is managed through a separate control.



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- Ideal for handling slips, bodies and glazes in the ceramics industry.
  - Capable of handling from 45 litres per minute up to 900 litres per minute depending on the application.
  - Computer designed coil enables highly efficient separation.
  - Available at 2500, 5000, and 10,000 gauss strengths to meet different application needs.
  - Magnetics are removed from the matrix automatically on a set timed sequence.
  - Available in a 4 and 6 valve auto self-clean configuration.

## LABORATORY SAMPLE TESTING SERVICE

To arrive at the best separation criteria, Bunting uses a fully equipped laboratory for material testing to ensure optimum equipment selection. Customers are invited to submit samples for testing and evaluation, to ensure that separation performance can be measured, with all the results and process recommendations being submitted for the client's approval. Initial trials are normally carried out free of charge and customers are encouraged, if practicable, to participate in the testing and processing procedure.

In addition, Bunting has established a working association with the Centre for Critical and Strategic Metals at the University of Birmingham. This link provides access to an extensive range of mineral processing and recycling facilities and additional expertise



## X-RAY FLUORESCENCE ANALYSIS (XRF)

X-ray fluorescence (XRF) is the emission of characteristic secondary (or fluorescent) X-rays from a material that has been excited by being bombarded with high-energy X-rays or gamma rays. The phenomenon is widely used for elemental analysis and chemical analysis, particularly in the investigation of minerals, metals, glass, ceramics, and building materials.

At our Bunting – Redditch test facility we can provide comprehensive chemical analysis of metal, mineral and soil samples by identifying elements such as Mg, Al, Si, P, S, Fe. It is also capable of precious metal and rare earth element analysis. This enables our technicians to make detailed and accurate recommendations on magnetic separation requirements and propose process flowsheet options to the customer.



# MAGNETIC PULL TEST KITS

## FIELD TESTING YOUR MAGNETIC SEPARATION EQUIPMENT

Bunting offers two options of magnetic pull test kits designed to field test your magnetic separation equipment.

### MAGNETIC PULL TEST KIT WITH STANDARD SCALE

Measure the force of your magnetic separation equipment with this affordable, reliable Bunting Pull Test Kit with Standard Scale. The test pieces and tools have been selected for testing a broad range of separation equipment and configurations. This precision instrument ensures consistency and repeatability, which are critical to gathering reliable test data from monitoring magnetic strength over time.

The standard-scale kit includes:

- 0 to 1/2-lb x 8-oz. force gauge
- 1 lb calibration weight
- Multi-gap spacer block
- 1/4" test ball
- 1/2" test ball
- 1/8" x 1" x 3" plate test piece
- Polarity indicator
- Storage case

### IMPROVED MAGNETIC PULL TEST KIT WITH NIST-TRACEABLE DIGITAL SCALE

Regular pull tests are critical for any magnetic separator, but especially for those used by food and pharmaceutical handlers due to the risk of contamination at any stage. The precision performance and calibration options of the Bunting custom-made digital scale make it superior to spring scale kits. Easy to use and competitively priced, the Bunting Pull Test Kit with Digital Scale includes an improved polarity indicator and a magnetic field-strength indicator for optimizing spacing between cartridges.

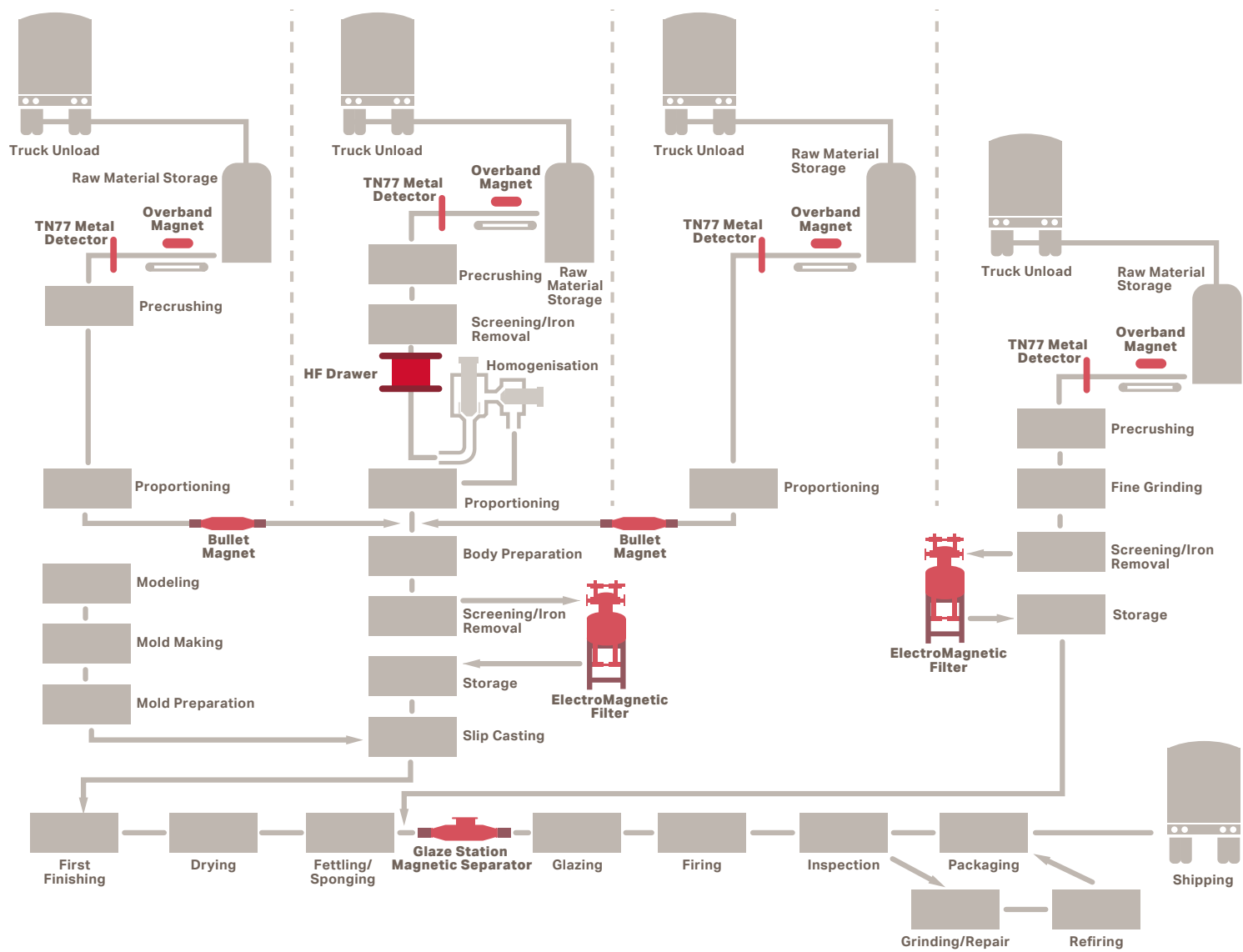
An optional version of the digital scale comes with National Institute of Standards and Technology (NIST) calibration check certificate, which is compliant with ISO and other quality and safety programs and renewable with the annual checkup and calibration.

The digital kit includes:

- Digital scale (NIST-optional traceable calibration)
- Digital scale charger
- Spacer block
- Test plate
- 1 lb calibration weight
- 1/4" test ball
- 1/2" test ball
- Polarity indicator
- Storage case

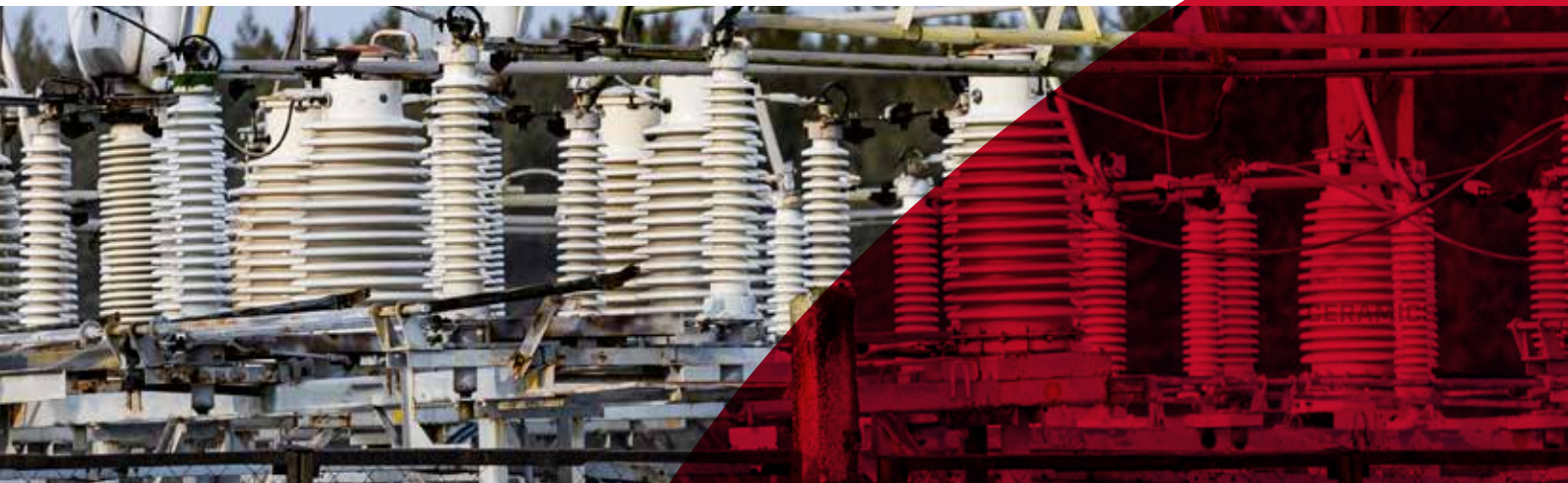
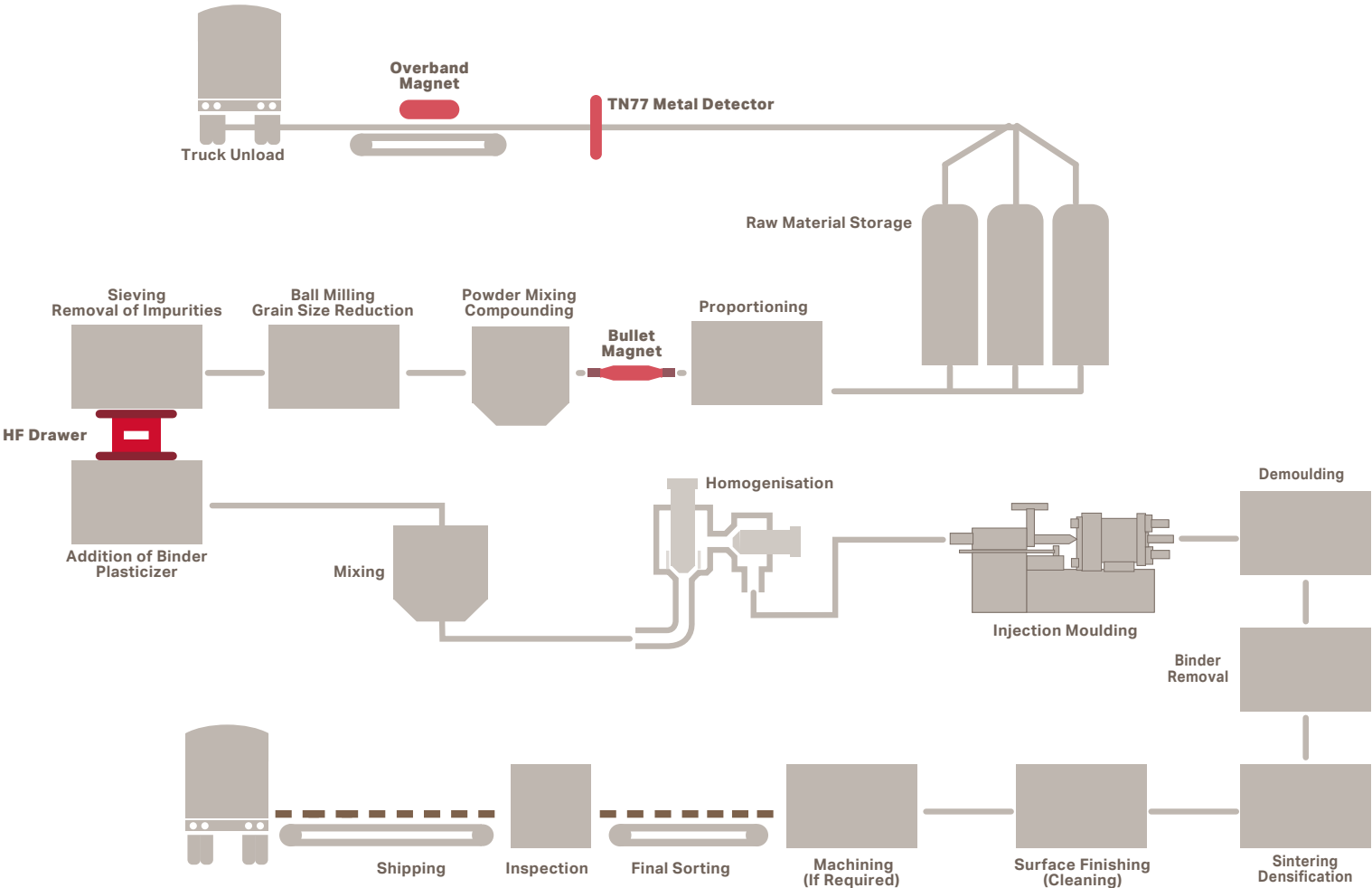


CERAMICS SANITARYWARE PERFECT PLANT

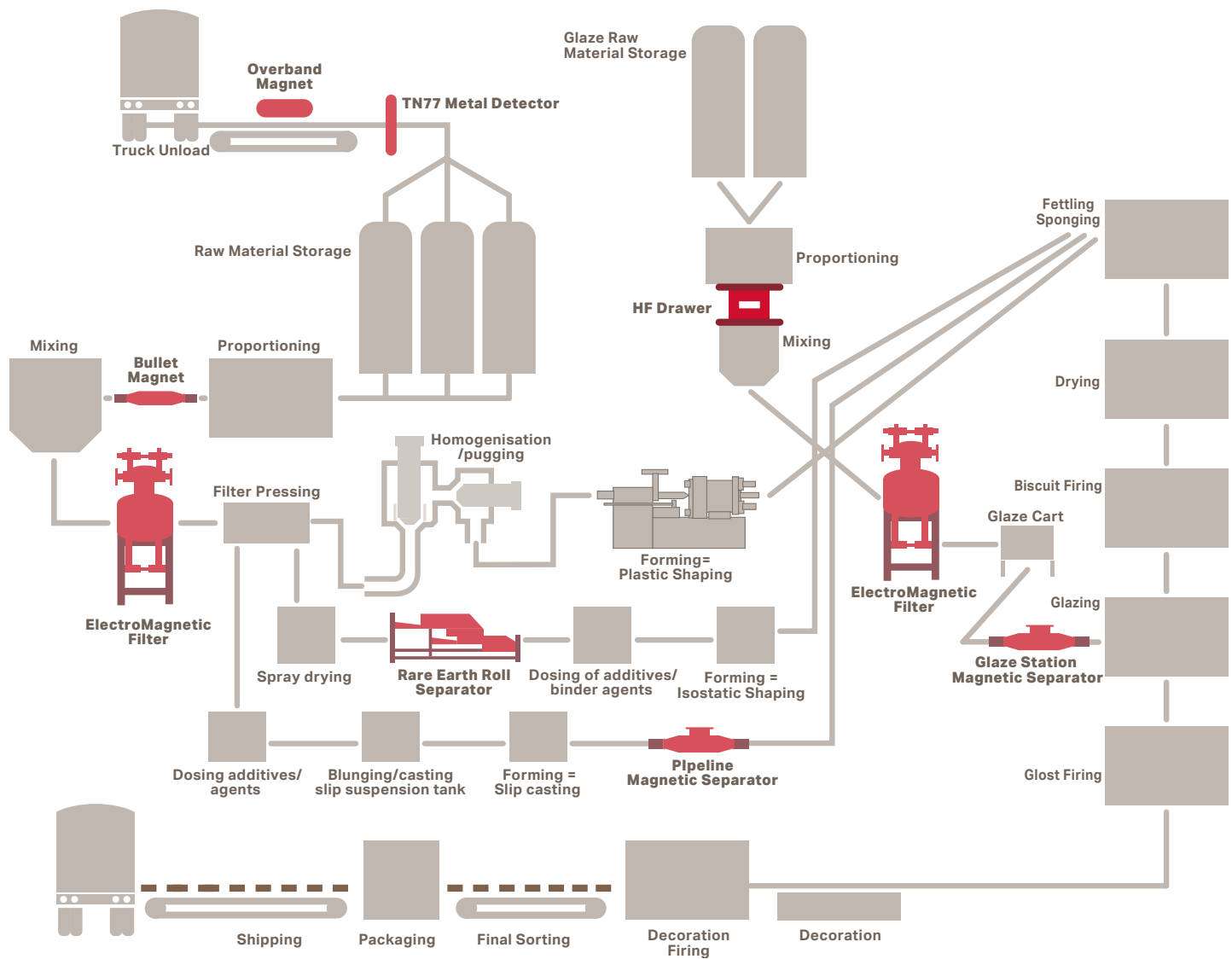




INJECTION MOLDED TECHNICAL CERAMICS PERFECT PLANT

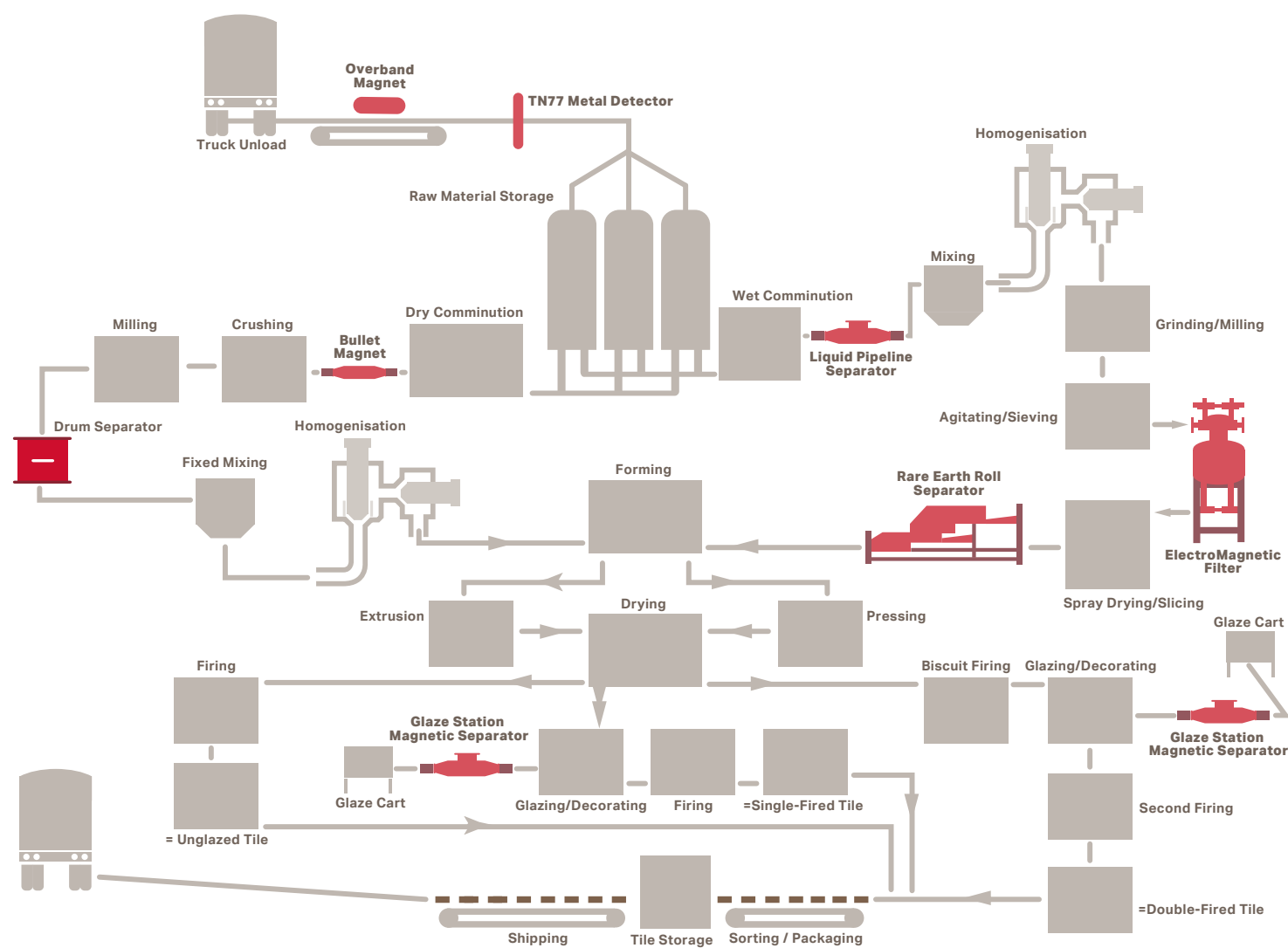


CERAMICS TABLEWARE PERFECT PLANT





CERAMIC TILE PROCESS PERFECT PLANT





# Pure success: What the Bunting name means to your ceramics business.

Bunting is proud to provide innovative, custom-designed solutions for the ceramics industry, as well as many other industries such as food and pharmaceuticals, recycling, and aggregate, mining, and minerals industries. Our equipment is durable, dependable, and driven by the needs of our customers and the modern challenges they face. Bunting has been a family-owned, family-led company since 1959. Sixty years later, we have made massive strides in developing new technology to meet the unique needs of the 21st century, while remaining committed to delivering the highest quality products accompanied by excellent customer service.

We invite you to experience our customer service and products for yourself. Contact your Bunting representative today for more information or to obtain a specific quote.

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**GLOBAL. MAGNETIC. FORCE.™**

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