



Improve Product Purity and Avoid Recalls with Magnetic Separators and Metal Detectors

By: Eric Confer,
Market Manager-
Eriez® Light Industry Team



RE7 Xtreme® Rare Earth Magnet

Improve Product Purity and Avoid Recalls with Magnetic Separators and Metal Detectors - White Paper

Every participant throughout the food and packaging industry supply chain must ensure foreign contaminants are not present in the products companies deliver to their customers. This white paper discusses best practices that processing plants use today for achieving the highest product purity and avoiding costly tramp metal damage by utilizing magnetic separators and metal detectors.

As a reader, you will learn about the relationship between magnetic separation and metal detection. It is important to understand how to foster product purity and equipment protection from the receiving dock to the shipping department. In addition, readers will discover why it is essential to engage in continuous training to stay up to date on product safety regulations and process improvements.

Magnetic Separation

Magnetic separators are very effective in applications where the goal is to extract ferrous and certain stainless steel before the food product is passed through metal detectors (discussed below). The magnetic separation industry is constantly evolving to meet customer demands. Manufacturers like Eriez® work to improve their products by applying state-of-the-art material sciences, engineering developments and manufacturing processes. Advancements in magnetic separators are made on a regular basis.

An independent research team proved Eriez' rare earth tube magnets are able to remove metal contamination with a pull-test strength that is 13 to 40 percent stronger than other commercially available models. Eriez commissioned The Pennsylvania State University (Penn State) to determine which commercial tube magnet most effectively removes dangerous ferrous metal and weakly magnetic contaminants from process flows. Thirteen tube magnets from various suppliers were stripped of brand identity and then provided to Penn State, the Behrend College, for testing.

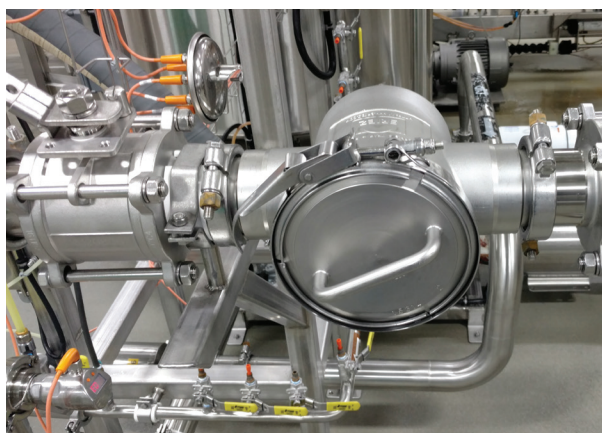
The findings showed the pull force of the Xtreme® RE7 Tube Circuit was substantially stronger than any of the other samples. Eriez' magnet was also among the best performers in terms of magnetic flux density.

(To download the full Penn State performance report, visit <https://www.eriez.com//RE7PennStatePerformance.pdf>.)

This RE7 magnet circuit is now incorporated into tube magnets, grate magnets and liquid line trap-style magnets. The increased power has a direct and positive impact on product purity and plant productivity. These advanced magnets incorporate a balance between high gauss and high pull force to influence tramp metal trajectory and hold on to the particulates, even during a wash-off process.



Metal detectors are used for raw material and finished goods inspection.



Magnetic traps are ideal for removing tramp iron contaminants in liquid line applications.

Many confectionery companies install a series of liquid line B-Traps or dry pneumatic RF cartridge magnets at the processing door of their plant. When the tanker truck comes to the side of the building and hooks up its hose, the B-Traps or RF cartridges on the other side of the building/wall ensure metal is not entering the plant.

Magnetic separation and metal detection equipment should be used throughout food processing, especially at the beginning. Some companies are most interested in the final package, and while that may be satisfactory, the added quality achieved by ensuring product is monitored from the start of the process increases purity and safety.

Metal Detectors

Plant operators cannot just assume that every supplier is sending a perfectly clean product. Realistically, there are many opportunities for contamination to occur before products arrive at the processing plant. Metal can come off the walls of a rail car. A fastener, nut or bolt may fall off a truck. A clamp can fall through the grate in the floor. It's surprising how often these things happen.

Today's metal detection products combine a precision mechanical design with state-of-the-art electronics, multiple frequency range, vibration immunity and complex algorithms to detect the smallest metals in difficult products. Industrial metal detectors are designed for harsh wash-down environments.

In a survey, field representatives and food processors determined what they sought in terms of today's metal detection systems. Here is a brief report:

- Customers seek metal detection systems for demanding applications. They must work in extreme low and high temperatures and also be able to withstand severe high-pressure washdown/environments.
- In a world where contamination results in recalls, processors stress the importance for monitoring, record keeping, and sophisticated electronics.
- Food processors want to detect the smallest contaminants possible, while minimizing the number of false rejects.

Government guidelines drive companies to create policies, procedures and protocols to ensure food safety. New metal detection systems have the ability to find smaller metal contaminants than previous metal detectors, even in difficult applications. The Eriez Xtreme® Metal Detector, for example, ships with factory pre-sets for various products based on actual testing and provided application data.



Magnetic grates allow free flowing product to pass between the magnetic tubes.



Iron particles are held against the magnetic tubes.

With the Xtreme software, even 24/7 monitoring from remote locations is possible. This continual data logging is imperative for corrective actions and auditing.

Food Safety Training and Services

Customers purchasing high-performance magnetic separators and metal detectors should have access to training. Training takes a number of forms, including in-plant training and webinars. There are also tutorial videos, case studies, product literature, installation and operation manuals and start-up installation support.

The best companies work with customers to understand their goals. What is the particular application? What size metal needs to be removed? Should you send a sample to be assessed for contamination levels?

Customers should seek to work with manufacturers that put an emphasis on proper equipment selection. A manufacturer must ask the right questions to ensure the customer gets exactly what they need. Customer education is also essential. The true worth of metal removal and detection should not be underestimated. There is great value in conducting an annual audit to see what changes can be made to improve product purity and protect equipment.

Conclusion

High-powered rare earth magnetic separators and metal detectors, along with smart manufacturing techniques, have raised the bar for product purity and equipment protection. Each day, diligent companies avoid recalls and damaged reputations. Companies must look closely at technology to be certain they are achieving the highest product purity possible.

Proper support and training enhance value beyond the price of the purchased equipment. Look for manufacturers who have developed a highly skilled worldwide representative network that is ready to meet processing and production challenges. Ongoing training and support helps food processors reduce the chance for tramp metal contamination, improve product purity and educate employees.

About Eriez®

Eriez is recognized as world authority in separation technologies. The company's magnetic lift and separation, metal detection, fluid recycling, flotation, materials feeding, screening, conveying and controlling equipment have application in the process, metalworking, packaging, plastics, rubber, recycling, food, mining, aggregate and textile and power industries. Eriez manufactures and markets these products through 12 international subsidiaries located on six continents.

For more information, call 814.835.6000, visit www.eriez.com or email eriez@eriez.com.

Eriez World Headquarters is located at 2200 Asbury Road, Erie, PA 16506.