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Ten Tips to Assure Long-Term Success With a Metal Detector

Electro-magnetic metal detectors have been a proven tool in food production lines for 65+ years. Although a metal detector seems like a simple, inexpensive device, it really is a super-sensitive radio frequency instrument and has to be treated as such for optimum performance.

To assure the highest level of food safety follow these practical, common sense tips:

1. Match your set-up to the product you are running: Your metal detector may not be configured for the product you are running. Learn how to preset programs for your products and keep laminated short-form instructions and test procedures by the detector for handy reference.

2. Test your rejecter on a regular basis to make sure it is rejecting product off the line correctly: Most rejecters are set-up to go off at a fixed distance or time and to fire for a certain duration from the metal detector head. If the rejecter is moved or the line speed is changed (and not sensed by a speed sensor) it may not work. Perform a simple rejecter test to ensure things are working properly.

3. Keep water from leaking into your metal detector: Most metal detectors can take a good washing on a regular basis and keep running for years. But as with any sealing system, the metal detector might leak eventually. Make sure all the control electronics are tightly connected to the metal detector and that all the incoming and outgoing electrical cables are always sealed. Periodically inspect the aperture to make sure the liner protecting the coils hasn't been damaged. Water inside the electromagnetic fields will imbalance the system and require expensive repairs.

4. Have a trained technician make sure the balanced system is in fact balanced: A metal detector is, by design, a balanced system. There is a self-correcting circuit to keep the detector in balance. If you have doubts about the balance of your metal detection system based on regular, consistent false rejects of the same type, call a trained technician to rebalance the system.

5. Remove as much vibration in your system as possible: Even the smallest movement of a metal detector's coils in relation to its metal case can result in a reduction in sensitivity. Make sure the installation is detached from production equipment causing vibrations, such as mixers, feeders or baggers. Most metal detection systems can "learn" the vibration signal and cancel it.

6. Don't hesitate to call the experts for regular preventative maintenance and calibration: If you are concerned that the tips described here are beyond your maintenance staff's abilities, you are not alone. All metal detector vendors offer convenient services to check, adjust, clean and certify your system. Sometimes having a 3rd party certification can help during quality audits too.

7. Make sure regular audits are being run to test the worst-case detection scenario: The least sensitive position in a metal detector aperture is in the center, where the metal is the furthest from the coils. Many times, metal test card are placed much closer to the coils than a metal contaminant inside the product would be. Test for the worst case on a regular basis.

8. Make sure new variable frequency drives aren't "talking" to the metal detector: Variable frequency AC drives can emit a lot of electromagnetic noise, resulting in false rejects. The best way to debug this is to turn on each piece of equipment adjacent to the metal detector one at a time to see what affect they have. If a machine or conveyor is affecting your metal detector, follow the supplier's recommendations for the use of external noise suppressors.

9. Check to see if your metal detector is receiving "noisy" power: A metal detector is designed to reject product when very small changes are detected. Noise spikes or ripple on the power lines can fool it into thinking metal is present, so always make sure you have a dedicated, clean power circuit feeding the metal detector.

10. Make sure the product conveying system hasn't become contaminated with metal: Metal can get into everything in a factory, including the conveyor belt passing through the metal detector. Typically, you can tell that your belt is contaminated if the metal detector displays a peak in the signal at regular intervals. If this is happening, clean or replace the belt. It is good practice to change the belt during your regular preventative maintenance.

Find out more at **thermofisher.com/metaldetection**

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