WP-15

Metal Detector Verification and Validation

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Eriez Xtreme® Tunnel Detector with Conveyor

Metal detector verification and validation are essential processes for ensuring your equipment is operating within your food safety programs' requirements. When these crucial steps are ignored or handled incorrectly, non-compliance can result and product impurities can go unnoticed. Either of these scenarios can be detrimental for a company. This white paper explores verification and validation to provide readers with understanding and guidance.

Defining Terms

Verification is the act or process of proving that the metal detector meets its sensitivity requirements. This is accomplished by challenging the detector in a repeatable manner with a certified metal sphere at a pre-described time. Most often, this procedure is executed at the same time on a daily basis.

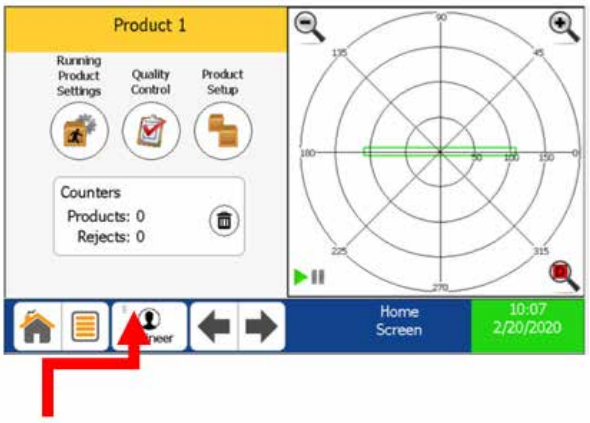
A correct test procedure requires the certified sphere to be placed on or in the product. This is especially important as some products may impact the detectability of certain metals, especially stainless steel. This is often overlooked as many operators simply place the metal test piece in or through the aperture without the product. For most third party audits, testing without product will result in non-compliance and, even worse, could allow metal to pass undetected during production.

Certified test pieces, as shown in Figure 1, are readily available and should include a certification number that corresponds to a certificate of compliance. The certificate confirms the sphere size and metal composition, and is essential to a comprehensive food safety program.

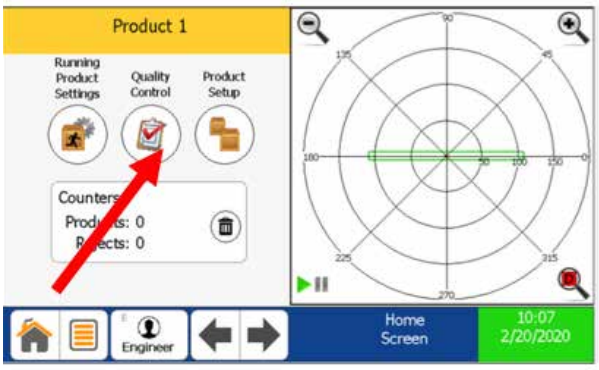
Validation is the process of authenticating the metal detector, ensuring the equipment is meeting the verification requirements. For instance, if your metal detector has been verified to detect a 2mm stainless sphere, a processor would validate these results (typically annually) using a third party.

Figure 1

Figure 2: The log captures every detection event to the second. It also documents the user's identity and details of the occurrence.



Step One



Step Two

Companies that validate equipment should provide the user with documentation in the form of a certification letter and sticker that is conspicuously located on the equipment.

Documentation is not limited to just the third party validations. A sound program must also include record-keeping. In other words, it is not enough to say you are verifying your equipment, you must prove you are doing this. Record-keeping varies by manufacturer. For example, Eriez Xtreme® Metal Detectors keep an event log, as shown in Figure 2.

Understanding the Importance of Verification and Validation

Investing in a metal detector can safeguard against machinery damage, production downtime and loss of product quality. In many operations, metal detectors are the last line of defense for detection of contaminants. Considering the importance placed on this equipment, it is easy to understand the heavy compliance standards surrounding the operation of this equipment in food processing applications.

Understanding and properly performing verification and validation processes will ensure your metal detector complies with your food safety program as well as other global regulations, including Food Safety Modernization Act (FSMA), Global Food Safety Initiative (GFSI) as well as current regulated Hazard Analysis Critical Control Points (HACCP) requirements. Ultimately, verification and validation processes play a significant role in keeping end-consumers safe. For Eriez and other high quality metal detector manufacturers, this is paramount.

Sidebar: A Step by Step Look at Verification

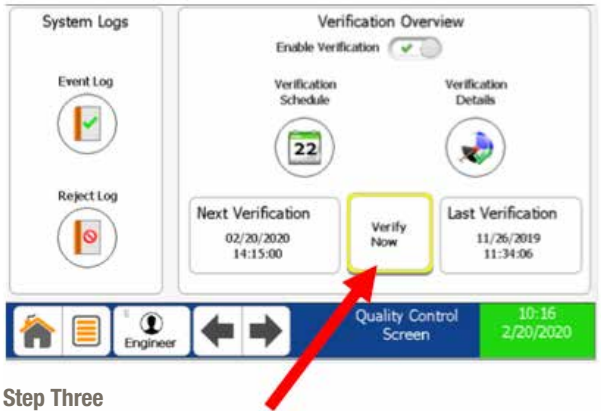
The following screen shots were taken from an Eriez unit. Processes vary based on specific equipment. This sidebar examines the Eriez Xtreme Metal Detector verification process to give readers a sense of how to perform a typical verification process.

Step One:

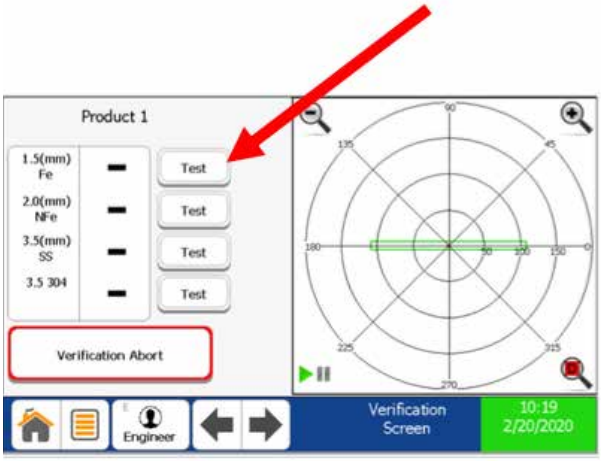
To start the verification process, the user starts at the home screen and clicks the third icon from the left (password enabling feature). Note that the verification procedure can only be performed at the quality control, supervisor and engineering levels, and is always password protected.

Step Two:

The user selects the "quality control" icon to access the verification screen.

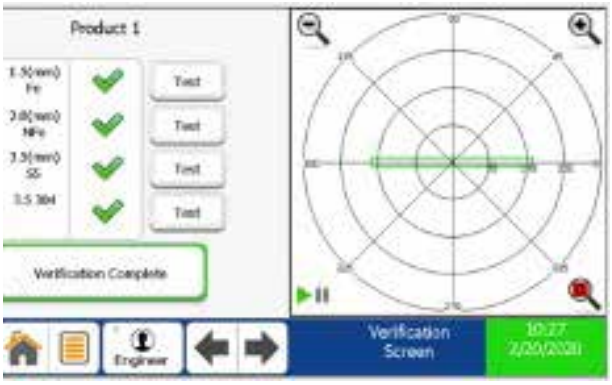


Step Three



Step Four

Step Five



Step Six

Step Three:

With the verification screen open, the user clicks the “Verify Now” icon.

Step Four:

The verification screen will populate and as many as four metal types and sizes will be shown. The user can also require the detector to test each metal size with unique passes. To start the process, click on the 1.5mm ferrous test icon and repeat the process for each metal type.

Step Five:

The detector will prompt the user to “Pass the 1.5mm Fe test on or in the product.” After the metal is detected, press the red stop sign icon. The user can repeat if your company QC procedures require more than one pass for each metal size.

Step Six:

After all metal samples have been successfully tested, the screen displays green check marks next to each size and the “Verification Complete” box is now highlighted in green. Pressing the “Verification Complete” icon finishes the verification.

Please visit us www.eriez.com for more information about our metal detection equipment.

Biography:

Ray Spurgeon Jr. is the Product Manager for the Metal Detection Division at Eriez Magnetics based at Eriez World Headquarters in Erie, PA USA. Since 1995 he has served in various capacities within Eriez inspection divisions including Assistant Product Manager and Technical Sales Representative.

Spurgeon has had numerous white papers published on foreign object detection. In his current role, he oversees all aspects of the metal detection division and has over 25 years of experience in applying metal detection technology in the rubber, plastics, food, aggregate and mining industries.

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