

# X-Ray Detection Buyer's Guide: How To Maximize Performance, ROI, & OEE

By Chris Young,  
Business Development Manager

**Anritsu**  
envision : ensure

# X-Ray Detection Buyer's Guide: How To Maximize Performance, ROI, & OEE

---

Perhaps it's been a while since you purchased an X-ray detection system. Or, this may be your first time. How do you choose the right system? This guide highlights what you need to know. We'll cover the less obvious aspects of cost and performance, and update you on recent technology advances and trending sanitation demands. The tips below can help you choose a system that not only meets your detection goals, but does so in a way that maximizes ROI and OEE (overall equipment effectiveness).

## KNOW THE COST AND LIFE EXPECTANCY OF REPLACEMENT PARTS

Most buyers today are savvy enough to know there's more to the cost of X-ray equipment than the upfront cost. If you are upgrading from metal detection to X-ray inspection, you'll want to factor in the ongoing costs of two expensive replacement parts: the tube (also called the generator) and the detector. To account for these ongoing costs, ask about the life expectancy and replacement cost for both parts before you buy. Similar to car buying, you will find some brands have longer-lasting parts than others.

## UNDERSTAND THE RELATIONSHIP BETWEEN HIGH PERFORMANCE AND LOW POWER USAGE

In choosing a system, it helps to understand how it works. The lifetime of an X-ray tube can be compared to that of a 3-way light bulb. The X-ray tube will eventually fail after a number of hours of use. The power setting impacts X-ray tube longevity. At a higher power setting, the tube fails sooner. But, before you think about reducing the power setting to increase the lifetime of the X-ray tube, understand there is a trade-off. Reduced power means reduced image quality, and thus poorer detection limits.

From an engineering standpoint, optimizing machines for both high performance and low power use is exceptionally challenging. That is why most X-ray machine manufacturers today specialize in either high performance (i.e., finding the smallest contaminants) or low-energy, long-life systems. Machines with high detection capability normally use high amounts of energy and therefore have very low lifetimes. Alternatively, machines using less power typically have poor detection rates.

That is **until now**. Anritsu has innovated to solve both needs with one machine.

At Anritsu, we challenged our engineers to develop a solution to reduce power usage while maintaining the high detection level

of our machines. Despite these divergent goals, our engineers succeeded in developing **advanced long life (ALL) technology**. Systems with ALL technology, such as the one shown [here](#), offer:

- an X-ray generator and detector with **three times the life** of conventional models
- a new more efficient cooling system
- less power consumption
- 20 percent reduction in lifetime costs

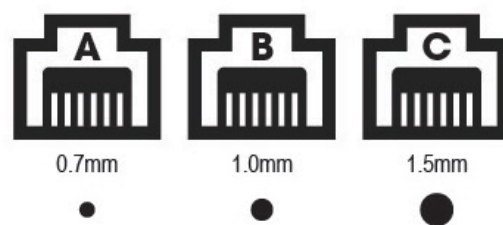
You no longer have to settle for high performance or lower power use — you can now have both. Currently, Anritsu is the only X-ray equipment maker to offer high performance at low power usage.

## DON'T IGNORE THE VALUE OF SUPERIOR DETECTION CAPABILITY FOR REDUCING FALSE REJECTS

One misconception we often hear with buyers is the belief that a machine just needs to be “good enough” to meet your detection specification. Many buyers are unaware that extra performance capability beyond your specification **is valuable**. This is best demonstrated by example.

---

Consider the three detection systems below that detect stainless steel at 0.7mm, 1.0mm, and 1.5mm respectively:



**Question:** Let's say your detection goal is to find stainless steel at 1.5 mm and greater. Assuming all other factors are equal (e.g., equipment cost, reliability), which system above adds the most value to the food processor?

**Choose the best answer:**

- System A
  - System B
  - System C
  - All of the above offer the same value.
-

# X-Ray Detection Buyer's Guide: How To Maximize Performance, ROI, & OEE



**Explanation:** On the surface it appears any of the above systems is a suitable detection solution. However, what many buyers don't realize is that superior detection capability (such as with Systems A and B that detect smaller contaminants than your specification level) can be "converted" to improve a machine's capability to reduce false rejects. How does that work? Superior performance capability enables your machine to be set at a lower sensitivity level and thereby reduce false rejects.

**Best Answer:** Returning to our example above, while you can meet your detection goal for stainless with system A, B, or C, your capability to reduce false rejects is strongest with System A. System A is the best answer due to its capability to not only hit your detection performance specifications, but also to significantly decrease false rejects.

**Maximizing OEE ensures current equipment is being used as effectively as possible, and therefore can prevent the need for investing in an additional line.**

## Why should you care about false rejects?

With the continued trend of downward cost pressure in the industry, food processors are increasingly paying attention to line efficiency using measures such as OEE. Many production plants are adding OEE as a key performance indicator to their operational metrics. Boosting the yield of production lines, by reducing false rejects, is an efficient way to increase the output of an operation without the capital costs and space required to install additional lines.

## What does OEE have to do with X-ray systems?

The OEE metric is comprised of three factors: machine uptime, process yield, and speed to determine overall effectiveness of equipment. False rejects are a waste of good product. They directly impact process yield and thus OEE of the line. X-ray systems with superior detection capability (i.e., smaller than your specification) improve your process yield by reducing false rejects.

In addition to reducing false rejects, superior detection capability provides flexibility to have a higher level of detection on an "as needed" basis. Imagine a scenario where you know something was accidentally dropped into a batch. Detection levels could be increased for a period of time to ensure the contaminants are found.

## CONSIDER THE IMPACT OF EQUIPMENT DESIGN ON YOUR SANITATION OPERATIONS.

While performance and cost are the most important criteria in your decision, customers are increasingly requesting clean design. Customers are looking to streamline sanitation processes and eliminate hiding places for biological contaminants. Design features such as easy parts removal/attachment, easy-to-clean conveyors, one-touch removal of shield curtains, and removal/attachment of rollers without tools can all streamline the cleaning processes. More efficient cleaning contributes to ROI. ●

## About The Author

Chris Young received his BSME from the University of Illinois, Chicago campus and has worked within the inspection equipment industry for the last 20 years.

Chris has held product manager, regional sales manager, and corporate account manager positions within 3 different inspection companies and has been fortunate to have been part of the tremendous growth of X-ray technology adoption within all of the food production industry.

# X-Ray Detection Buyer's Guide: How To Maximize Performance, ROI, & OEE

---



VISIT [ANRITSU.COM](http://ANRITSU.COM) TO ADVANCE FOOD  
SAFETY AND RAISE INSPECTION STANDARDS  
WITH THE ACCURACY AND RELIABILITY OF  
ANRITSU X-RAY INSPECTION SYSTEMS.

---

**Anritsu**  
envision : ensure

## About Anritsu

Anritsu is a technology driven company that designs and manufactures inspection and detection equipment for the food and pharmaceutical industries. Anritsu's best-in-industry X-Ray, Checkweighing, and Metal Detection technology keeps production lines running at peak performance with a higher ROI. With over 130,000 installations globally, we are at the forefront of technology, exceeding the highest standards of product safety and compliance, making sure that all points of detection on your line are secure.

[www.anritsu.com](http://www.anritsu.com) • 847-419-XRAY (9729)