

IX series

ISHIDA X-ray Inspection System
Protecting your customer and your brand



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ISHIDA X-ray Inspection Systems

ISHIDA X-ray inspection can be used at any stage in your production line to identify with the greatest accuracy and reliability when foreign bodies are contaminating your product, thus protecting your brand and reassuring your customers.

Benefits of an X-ray inspection system

X-ray inspection has several key benefits, especially for food producers, that are fundamentally linked to safety and quality:



Brand protection

- Customers will trust the product



Food safety

- The food is free of foreign bodies and safe to eat



Can do much more than just finding foreign bodies:

- Counting components
- Weight estimation
- Checking fill level
- Detecting flaws such as missing or broken items
- Measuring product size
- Sealing control

All these functions in one machine lead to a cost-effective and efficient performance



Cost savings due to no product recalls and customer complaints

- Fewer recalls and customer complaints lead to less fines



Confidence

- You as a supplier are using the state-of-the-art technology and can therefore be confident of quality



Due diligence / auditing

- Up-to-date records of all products including rejects, with all data and images stored securely

Finds metal, glass, stone, bone, shell, rubber and dense plastics



IX series



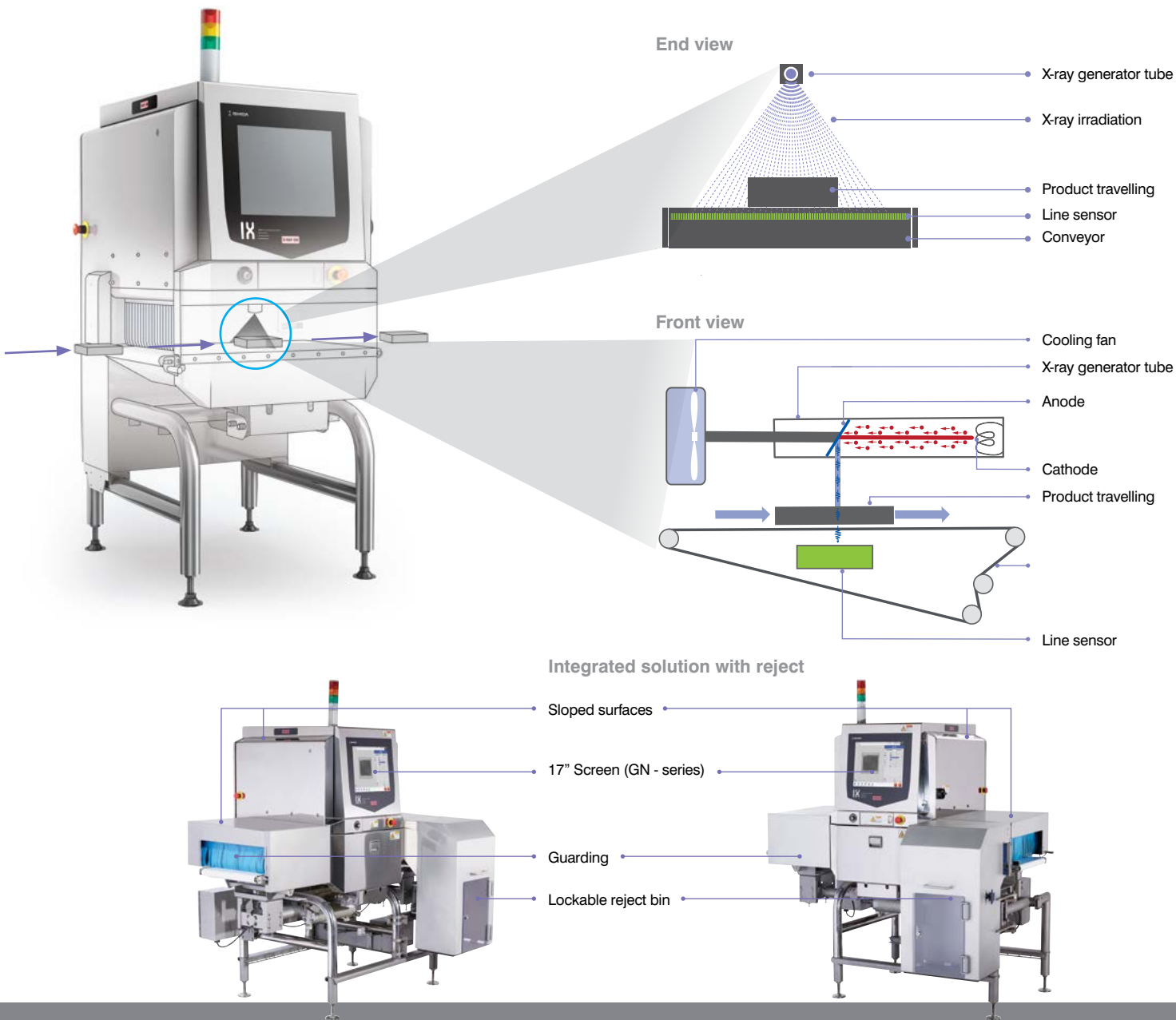
How ISHIDA X-ray works

X-rays are used to see through objects to get a clear picture of what is inside. ISHIDA X-ray inspection systems are primarily used to detect foreign bodies such as dense plastic, rubber, metal, bone, shell, stones or glass to prevent them from contaminating a product.

Principles of X-ray inspection device

X-rays are transmitted onto the product. A line sensor captures an image formed by the penetrating X-rays and a complex image analysis procedure identifies foreign material or defective/missing products.

As well as spotting any foreign bodies, X-ray machines can detect a wide range of product defects, and can also check product or piece weights.



Highly sensitive foreign body detection using Genetic Algorithm (GA) technology

What if detection is needed for multiple types of foreign bodies in one product?

Evolutionary image processing* (GA)

GA (Genetic Algorithm) is a patented technique which is used exclusively in our IX Series. It allows you to accomplish a very high detection sensitivity on your products which cannot be accomplished anywhere else.

The use of GA allows the user to optimise the X-ray machine for their own unique product characteristics. Each GA can be tuned to focus on a specific foreign body that pose an inherent risk to the product. As such, every ISHIDA instrument can be uniquely and easily optimised to meet your specific challenges.

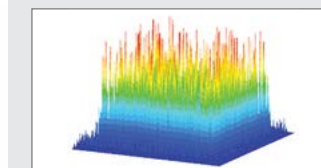
GA benefits

- Improves sensitivity and detection rate
- No need to send product or contaminant to a manufacturer's lab – everything is done on site
- No need for service engineer or operator intervention

Example: detecting foreign matter in a pack of sausages



Generation 100



Unevolved image processing
Foreign matter cannot be identified from the uneven profile of the sausages

Generation 1,000

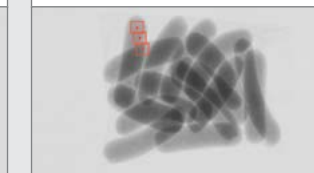
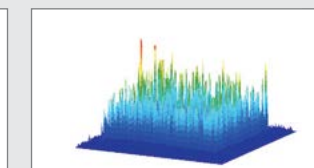
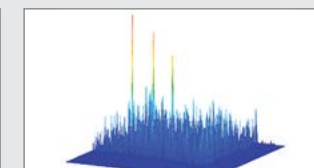
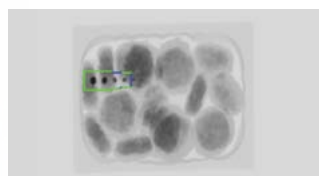


Image processing in evolution
Background product effect is reduced enabling foreign bodies to be identified

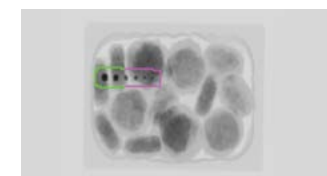
Generation 10,000



Evolved image processing
The background product effect is further reduced enabling foreign bodies to be identified



Without GA



With GA



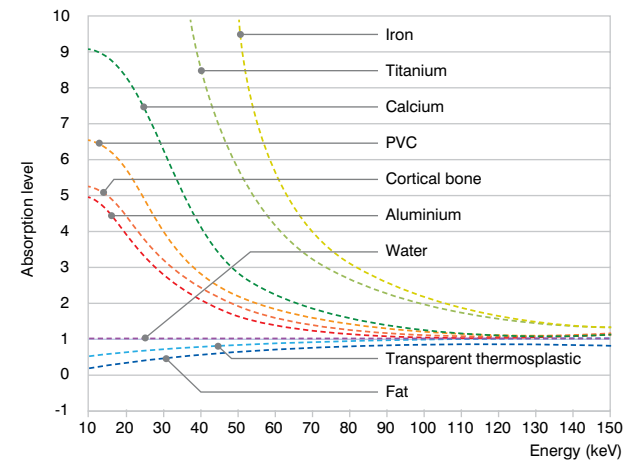
The benefits of low voltage

For contaminants of low density, such as bones in meat products, lower voltage X-rays created by using less kV show a greater difference between the elements.

Our most popular model of IX machines use a 300W generator, which allows us to vary the kV value from 25-75kV and the current from 1-8 mA (depending on the model).

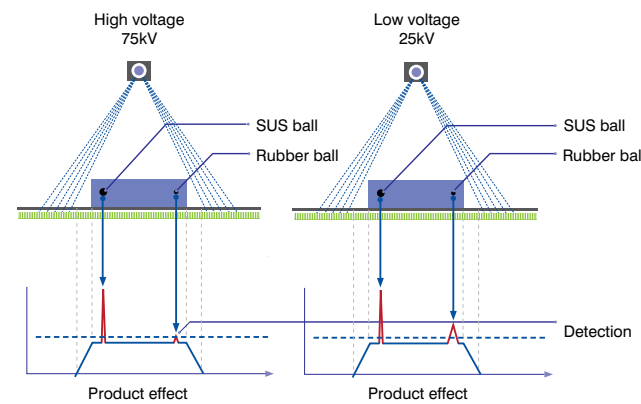
The ability to vary the KV and mA gives ISHIDA a strong advantage in the detection of lower density foreign bodies.

The graph below shows how different materials behave with low and high levels of energy. The lower the energy, the higher the absorption difference which leads to better detection results.



Examples with rubber ball

The image below depicts the effect of using lower voltage X-rays, with the rubber ball being more clearly visible in the right hand image, because the rubber stops a greater percentage of the X-rays penetrating through when lower energy is used.



Hygienic

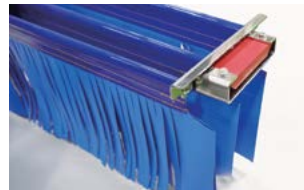
The device is HACCP-compliant (IP66), boasting an all-stainless steel structure and waterproof inspection chamber. The protective curtains and conveyor can be removed easily without tools.

Easy removal and refitting of components

GN model is supplied with Magnetic interlock. A mechanical interlock system on other models makes the process of removing and reinstalling protective curtains extremely simple, reducing the risk of damage to the switch.



Protective curtain



Non-contact switch (optional)



Magnetic interlock

IX series Range Overview





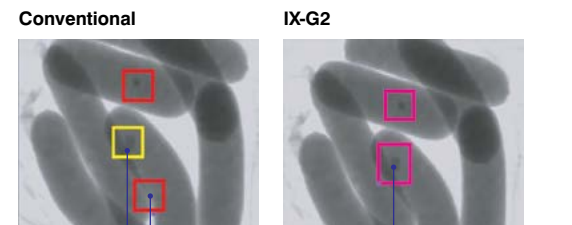
IX-G2 series

Dual Energy Sensor detects what other inspection systems miss

Most effective X-ray detection of low-density objects, including bone, shell, metal, glass and rubber.

Ergonomic, stainless steel design, making it easy to clean.

- Pinpoint detection of foreign bodies under 0.6mm thanks to enhanced G2 technology, from shell and stone, to metal and bone.
- Accurate X-ray inspection capable of handling packaged products with uneven surfaces, granular products and overlaps.



Bone not detected
False detection

Bone detected



Complex* products from 0-60mm

Low density foreign bodies

Examples of complex products



Poultry Vegetables Cereals Overlapping meat products



Bones Stones Glass

* Products which include different thicknesses, are overlapping etc.

For detailed information on the applications the IX-G2-series can handle, please refer to the "Foreign Body detection matrix" table on the page 15.



IX-GN series

The definite choice for a wide range of products

GN series provides high-performance X-ray inspections for an unrivalled range of foreign matter.

Ergonomic, stainless steel design, making it easy to clean.

- Unrivalled versatility for a wide range of packed and unpacked products.
- GA image processing automatically generates optimal sensitivity for fast and efficient product changeovers.
- Integrated air conditioning system.
- User-friendly 17" touch screen control.



Uniform* products (0-220mm)

Complex** products (above 60mm)

High density and low density foreign bodies

Examples of uniform products

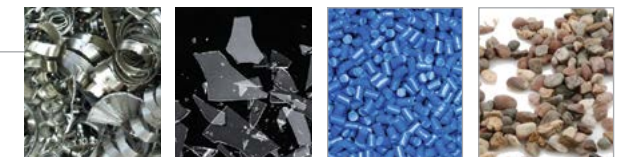


Bread, cookies Cheese Confectionery Ice cream

Examples of complex products



Meat Cereals Yoghurt pots Sausages



Stainless Steel Ferrous/Non-ferrous Glass Teflon, PVC Stones

* A group of products that are standardized or identical.

** Products which include different thicknesses, are overlapping etc.

For detailed information on the applications the IX-GN series can handle, please refer to the "Foreign Body detection matrix" table on the page 15.

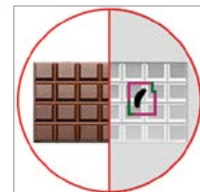


IX-EN series

Your first step into ISHIDA X-ray technology

The X-ray inspection system that enhances quality control on your production line, both affordably and effectively.

- Reliable inspections suitable for uniform products.
- Easy to set up and integrate into your production line.
- User-friendly 15" touch screen control.

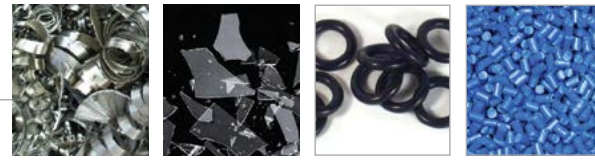


Thin products (0-50mm) - XX62/63



Chocolate bars Cereal bars Sliced cheese Dried Fruits

High density and low density foreign bodies



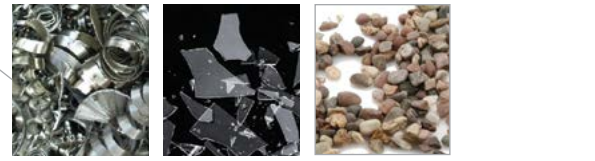
Stainless Steel Ferrous/Non-ferrous Glass Rubber Teflon, PVC

Thick products (50-150mm) - XX93



Bread Yoghurt pots Pastry Cake

High density and low density foreign bodies



Stainless Steel Ferrous/Non-ferrous Glass Stones

For detailed information on the applications the IX-EN series can handle, please refer to the "Foreign Body detection matrix" table on the page 15.

IX Middle/Large series

All the security of X-ray inspection for middle and large items



IX-EN-5592

- With an inspection chamber of 550mm wide and 270mm height the IX-EN-5592 can inspect a 25kg bag or block of butter/cheese.
- User friendly 15" touch screen control.



IX-GA-65100

- With X-ray tube voltage of up to 100KV, IX-GA-65100 can handle a 65cm-wide box carton.
- Items can be up to 25kg (option 50kg).



Larger products - EN-5592



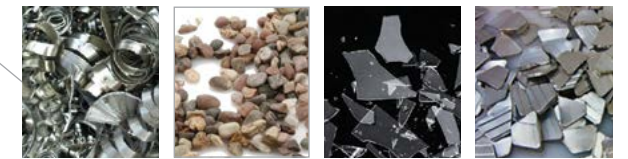
Bag of pet food Large block of cheese Tray of meat Large pizza

Larger products - GA-65100



Box carton Sack of rice

High density and low density foreign bodies



Stainless Steel Ferrous/Non-ferrous Stones Glass Ceramic

For detailed information about IX-EN-5592 and IX-GA-65100 series, please refer to the "ISHIDA X-ray differentiation" table on the page 14.

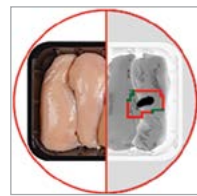


IX IP69K rated model
IX-GA-2475-DK
IX-GA-4075-(A)DK

Durable and hygiene design for high pressure washing

The IX-GA DK series are fully equipped with special features for keeping out water.

- Resin cover for the touch screen panel and the stack light.
- The IP69K-compliant key switch and emergency switch.
- Integrated water cooling type air conditioning system.



Examples of complex products



Poultry Fish fillet Salad Cheese

Complex* products

Low density foreign bodies



Bones Stones Glass Stainless Steel Ferrous/Non-ferrous

* Products which include different thicknesses, are overlapping etc.

For detailed information about IX-GA-DK series, please refer to the "ISHIDA X-ray differentiation" table on the page 14.

IX-GA-2475/4075-DK



IX side beam model
IX-GA-B3043

ISHIDA Bottle X-ray inspection system IX-GA-B3043 delivers the highest level of inspection performance for bottled products

- Achieves industry leading sensitivity.
- Easy-to-install in existing production lines.
- Small footprint.
- Automatic bottle pitch control.
- The unique way that the ISHIDA side beam is designed means that no protective curtains are needed, ensuring perfect product transition.



Examples of upright products



PET bottles Pouch packaging Tetra-pak Cartons

Upright products

High density and low density foreign bodies



Stainless Steel Ferrous/Non-ferrous Stones Glass

For detailed information about IX-GA-B3043 series, please refer to the "ISHIDA X-ray differentiation" table on the page 14.

IX-GA-B3043

ISHIDA X-ray differentiation

	IX-EN xx62/63	IX-EN xx93	IX-GN xx43/44	IX-EN-5592	IX-GA-65100	IX-GA-B3043	IX-G2 xx27	IX-GA xx75-DK
Hygiene								
Sloped surface	●	●	●	●	●	●	●	●
Toolless disassembling for cleaning	●	●	●	●	●	●	●	●
Machine rating	IP54	IP54	IP65	IP54	IP65	IP65	IP65	IP69
Inspection chamber rating	IP66	IP66	IP66	IP66	IP66	IP65	IP66	IP69
Mechanical interlocks	●	●		●	●	●		
Magnetic interlocks			●				●	●
Image processing								
Standard image resolution for an optimum detection on small and hard foreign bodies	●			●				
High image resolution for a better detection on small and hard foreign bodies		●			●	●		
Finest image resolution for an enhanced detection on small and hard foreign bodies			●				●	●
5 levels for customizable and powerful algorithms	●	●		●	●	●		●
7 levels for highest quality standards to ensure market leading sensitivity			●				●	
Dual Energy technology for enhanced detection of bone and other lower density materials and improved detection in overlapping products							●	
X-ray power								
Minimized power range, perfect for thinner products	●							
Optimum power range for medium sized products		●		●			●	●
Full flexible power range suitable for a wide range of products			●		●	●		
Usability								
Quick production start up time (30-90 sec)	●	●	●	●	●	●	●	●
15" Remote Control Unit (RCU)	●	●		●	●	●		●
17" Remote Control Unit (RCU)			●				●	
Interfaces for saving images and statistics	USB, CF Card, Ethernet	USB, CF Card, Ethernet	USB, CF Card, Ethernet	USB, CF Card, Ethernet	CF Card, Ethernet	CF Card, Ethernet	CF Card, Ethernet	CF Card, Ethernet

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Foreign body detection matrix

Product type	Foreign body	Foreign body					Natural	
		Metal	Glass	Rubber	Teflon	Stone	Bone	
Uniform*	Dairy	Sliced cheese	●	●	●	●	●	
		Yoghurt	●	●	●	●	●	
		Ice-cream	●	●	●	●	●	
	Confectionery	Chocolate bar	●	●	●	●	●	
		Box with chocolate	●	●	●	●	●	
		Cookies	●	●	●	●	●	
	Meat	Minced meat	●	●	●	●	●	●
		Steak	●	●	●	●	●	●
		Burger	●	●	●	●	●	●
	Dried fruit	Packed	●	●	●	●	●	
Bulk		●	●	●	●	●		
Complex**	Meat	Chicken fillet	●	●	●	●	●	●
		Sausages in bag	●	●	●	●	●	●
		Overlapping burger	●	●	●	●	●	●
		Sausages in bulk	●	●	●	●	●	●
	Cereal	Bulk	●	●	●	●	●	●
		Packed products	●	●	●	●	●	●
	Vegetables	Green bean	●	●	●	●	●	●
		Broccoli	●	●	●	●	●	●
		French fries	●	●	●	●	●	●
	Dried fruit	Packed	●	●	●	●	●	●
Bulk		●	●	●	●	●	●	

Key to foreign body detection:

- G2 ● GN ● EN
- Optimum solution ● Solution allowed



* A group of products that are standardized or identical.
 ** Products which include different thickness, overlapping etc.